

**CONTRACT NO. DACW49-03-C-0027
ABATEMENT ACTIVITIES IN BUILDING 401
AND SURROUNDING AREA
NIAGARA FALLS STORAGE SITE
LEWISTON, NEW YORK**

CONTAMINANT ABATEMENT PLAN

Prepared For

US ARMY CORPS OF ENGINEERS

Prepared By

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First Draft: December 26, 2003

NFSS_0001

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Site Description and Scope of Work	1
1.2	Background Information	2
2.0	PROJECT MANAGEMENT ORGANIZATION AND RESPONSIBILITY	2
2.1	Abatement Organization	3
3.0	WORK PLAN	9
3.1	Notification Requirements	9
3.2	Confirmation Sampling - Mastic	9
3.3	Personal Decontamination Enclosure System	10
3.4	Moveable Objects	10
3.5	Pre-Cleaning	11
3.6	Isolation Barriers	11
3.7	Signage	11
3.8	Engineering Controls	12
3.9	Work Entry and Exit Procedures	12
3.10	Removal Methods	13
3.11	Clean-Up	14
3.12	Disposal	15
4.0	THIRD PARTY MONITORING	15
5.0	TRAINING REQUIREMENTS	16
6.0	SCHEDULE	16
7.0	RADIOLOGICAL MONITORING	17

TABLE OF CONTENTS (Continued)

APPENDIX A - SITE MAPS

APPENDIX B - RESUMES OF KEY PERSONNEL

**APPENDIX C - NEW YORK STATE ASBESTOS SUPERVISOR CERTIFICATE
MIKE LYNCH (FRONTIER INSULATION CONTRACTORS, INC.)**

**APPENDIX D - NEW YORK STATE ASBESTOS HANDLING LICENSE
FRONTIER INSULATION CONTRACTORS, INC.**

APPENDIX E - SHOWER WATER FILTRATION SYSTEM AND HEATER

APPENDIX F - MICRO-TRAP NEGATIVE AIR FILTRATION UNIT

APPENDIX G - RESPIRATORS

APPENDIX H - HEPA VACUUM

APPENDIX I - ENCAPSULANT MSDS

APPENDIX J - CHOPRA - LEE MONITORING PLAN

APPENDIX K - PROJECT SCHEDULE

1.0 INTRODUCTION

This Contaminant Abatement Plan (CAP) establishes the procedures, controls, training and monitoring required to abate identified asbestos-containing materials (ACM) at Building 401, Niagara Falls Storage Site, Lewiston, New York. Abatement activities will be performed by Sudhakar Company, Inc. (Sudhakar) for the U.S. Army Corps of Engineers (USACE) under the Abatement Activities in Building 401 and Surrounding Area - Niagara Falls Storage Site, Lewiston, New York Contract (Contract No. DACW49-03-C-0027). This Contaminant Abatement Plan will be supplemented by: 1.) Sudhakar's Accident Prevention Plan (APP); 2.) Contractor's Quality Control (CQC) Plan; and 3.) Sampling and Analysis Plan. In addition, this CAP may be modified or amended for any additional abatement ordered by USACE under this Contract.

The CAP has been prepared to comply with 12 NYCRR Part 56 (Industrial Code Rule 56), 40 CFR Parts 61 and 763, 29 CFR 1926, and USACE's EM 385-1-1.

1.1 Site Description and Scope of Work

Niagara Falls Storage Site (NFSS) is part of the USACE Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP was established to decontaminate or control sites where residual radioactivity exceeding the current guidelines remains from the activities supported by the nation's atomic energy program.

NFSS is located at 1397 Pletcher Road, Lewiston, New York, and the site is owned by the U.S. Department of Energy (DOE). The site consists of an engineered, clay-capped Waste Containment Structure (WCS), various buildings, and open areas (**APPENDIX A**). The site was originally a part of the Lake Ontario Ordnance Works (LOOW). The primary use of the site from the early 1940's through mid 1950's was for storage, trans-shipment, and disposal of radioactive waste from various sources. Building 401 was initially the powerhouse for the production of TNT at LOOW, and it was also used to store radioactive materials in support of the Manhattan Engineer District (MED) activities during World War II. It was used for the production of Boron-10 from 1953 to 1959 and from 1965 to 1971 and then became a waste storage facility by MED. In 1971, Building 401 was gutted and its instrumentation and hardware were disposed of as surplus materials.

This building has been largely inactive since, and evidence of bird and animal occupation has been observed.

Building 401 is a steel-framed four story structure enclosing approximately 100,000 square feet of floor area. The main structural system of the building consists of steel and concrete load bearing walls supporting what may be a transite roof. The interior walls are concrete, concrete block and other various materials. The exterior appears to be corrugated transite siding and roofing. Inside the building there are multiple floors, which contain rooms and offices and building service areas (boiler rooms and tower areas). There is also a tower area and high bay that may be as high as 75 feet. The building floor is concrete slab on grade. There are posted areas of elevated radioactivity in soils adjacent to Building 401. Sudhakar and subcontractors are prohibited from entering these posted areas and will avoid working in their general vicinity, where practicable.

An asbestos abatement was performed on Building 401 in the spring and summer of 2002. A small amount of ACM remains in Building 401. USACE has contracted Sudhakar to abate these remaining areas. The following areas will be abated as part of this Contract:

- ACM in Room 118 (floor tile, transite panels, pipe and/or fitting insulation, transite pipe; and
- wooden floor area of approximately 18 feet by 36 feet in Rooms 144 and 145 which may have ACM mastic ingrained in the wood.

1.2 Background Information

In accordance with ERM 385-1-1, Appendix A, Section 2, the following information is provided for reference:

- **Contractor** - Sudhakar Company, Inc.
- **Contract No.** - DACW49-03-C-0027
- **Project Name** - Abatement Activities in Building 401 and Surrounding Area -
Niagara Falls Storage Site, Lewiston, New York

- **Sudhakar Safety Record** - Zero (0) Reportable Injuries in Environmental/Construction Division since Company inception in 1993. (EMR for calendar year 2002 = 0.75)

2.0 PROJECT MANAGEMENT ORGANIZATION AND RESPONSIBILITY

Sudhakar Company, Inc. (Sudhakar) is committed to comply with all Federal, State and local rules and regulations and has established a zero violation policy for all projects. All personnel involved with any work performed under this Contract will follow the procedures, controls, training and monitoring procedures set forth in this CAP. Willful or repeated violations of the CAP subject the employee and/or subcontractor to severe disciplinary action or termination. Visitors will be notified of any potential hazards prior to entry into the construction area.

2.1 Abatement Organization

Sudhakar's Abatement Organization Chart is depicted below. Resume's of key abatement personnel are included in **APPENDIX B**. Abatement responsibilities proceed according to the following hierarchy: 1.) President; 2.) Division Manager; 3.) Site Superintendent/Site Safety Officer; 4.) Abatement Subcontractor/Third-Party Monitoring Firm/Radiological Monitoring Firm.

Ash Sudhakar - President Sudhakar Company, Inc. - As President, Mr. Sudhakar has established the zero violation goal for Sudhakar Company, Inc. In addition, for each project, Mr. Sudhakar authorizes the: 1.) Division Manager; 2.) Site Superintendent; and 3.) Site Safety Officer (for projects with a dedicated SSO) **to shutdown any project in which a potential or real environmental compliance issue exists.** All Division Managers are required to: 1.) notify Mr. Sudhakar of regulatory inspections; 2.) notify Mr. Sudhakar of any notices of violations (NOV's); 2.) immediately investigate any environmental violations; and

3.) develop a Corrective Action Plan to prevent further incidents of non-compliance.

Daniel McGuire - V.P./Division Manager - As Division Manager, Mr. McGuire will be responsible for developing all Work Plans; reviewing all work procedures; preparing asbestos Activity Hazard Analysis; and manage any environmental compliance issues that cannot be addressed directly by the Site Superintendent or Abatement Supervisor. Mr. McGuire will also develop Corrective Action Plans in the event of a NOV, citation or non-compliance. Mr. McGuire has the authority to shutdown any project in which a potential or real environmental compliance issue exists. In addition, Mr. McGuire will make periodic compliance inspections of the abatement site.

Neil Raddu - Site Superintendent - Day-to-day abatement operations will be administered and monitored by the Site Superintendent. For this project, the Site Superintendent will be Mr. Neil Raddu. Mr. Raddu has the authority to shutdown projects at any time a potential or real environmental compliance issue exists. Mr. Raddu has been a FUSRAP Site Superintendent since 1996. In addition, Mr. Raddu is a licensed and trained Asbestos Supervisor with many years of ACM abatement experience. The Site Superintendent shall be responsible for the following tasks:

- * assuring all abatement personnel (abatement workers, radiological technicians, third-party monitoring technicians) sign-in and out each and every day;
- * performing routine site inspections to ensure that all work is being performed in accordance with the CAP procedures;
- * coordinate abatement activities with: 1) abatement contractor; 2) third-party monitoring firm; and 3) radiological monitoring firm;

- * ensuring that protective clothing and equipment are used, maintained, and stored in accordance with the CAP;
- * ensuring that all health and safety monitoring (area sampling, personnel sampling, radiological monitoring) is performed in accordance with technical specifications and regulatory requirements;
- * contacting the appropriate authorities in the event of an emergency as detailed in Section 7.0, Contingency Planning of the APP;
- * preparing daily CQC Report in accordance with Contractor's Quality Control (CQC) Plan;
- * notifying Division Manager of any regulatory inspections, notices of violation (NOVs); compliance issues; and any complaints from USACE regarding the abatement activities;
- * assure all abated ACM has been packaged and stored on-site in compliance with the CAP;
- * contacting USACE after all abatement is complete and final clearance samples indicate abated areas are "clean"; and
- * conduct Final Inspection.

The Site Superintendent has responsibility for implementing and enforcing the CAP. In the event that the Site Superintendent is not present on site, all duties of the Site Superintendent shall be assumed by the Alternate Site Superintendent. For this project, Sudhakar has assigned Mr. Larry Greene as the Alternate Site Superintendent.

Larry Greene - Alternate Site Superintendent - Mr. Green will accept the duties of the Site Superintendent in the event Mr. Raddu is not available. Mr. Greene has been working at the NFSS since 1999 and is a licensed and trained Asbestos Supervisor with many years

of ACM abatement experience.

Mike Lynch - Asbestos Abatement Supervisor - Frontier Insulation Contractors, Inc. -

Sudhakar intends to subcontract the asbestos abatement to Frontier Insulation Contractors, Inc. of Buffalo, New York. Mr. Lynch is Frontier Insulation Contractors, Inc.'s (Frontier's) Project Manager/Estimator and has over thirteen (13) years of abatement experience. Mr. Lynch has a New York State Asbestos Supervisor certificate (**APPENDIX C**) and Frontier is a licensed New York State abatement contractor (**APPENDIX D**). Mr. Lynch will report to the Site Superintendent. As the Asbestos Abatement Supervisor, Mr. Lynch will:

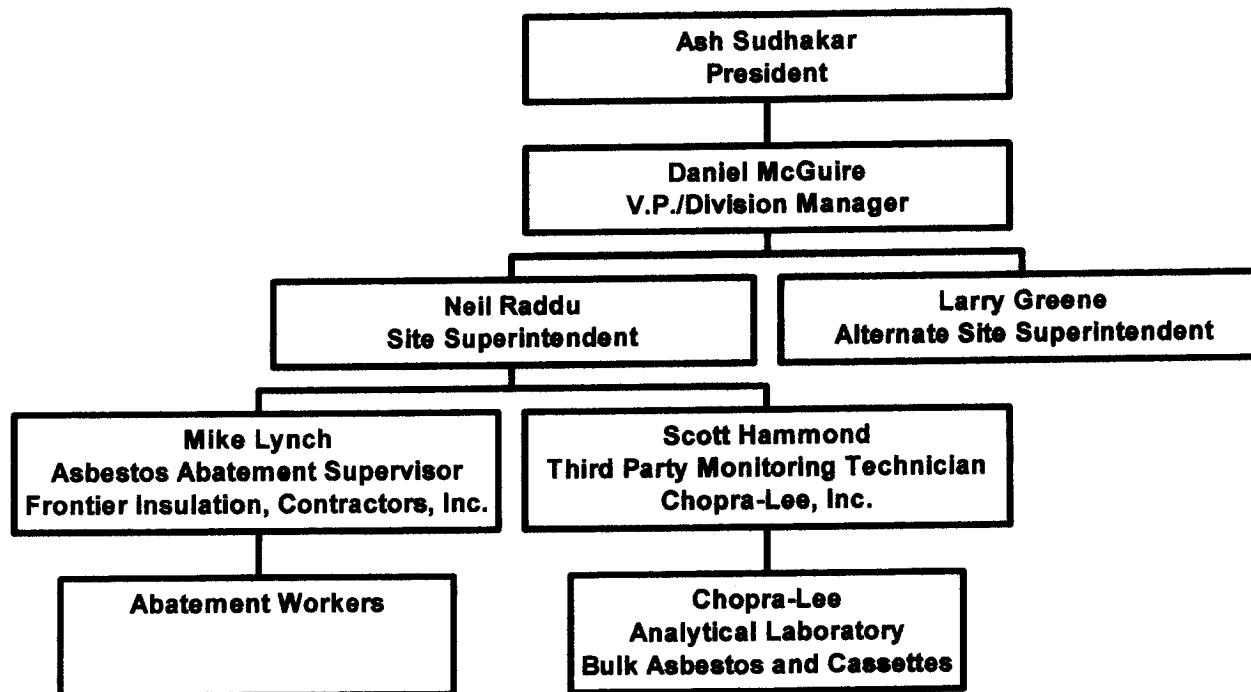
- * provide certificates of training (asbestos, HAZWOPER, and RAD Worker II) for all abatement workers prior to mobilization to the site (only trained and experienced personnel will be allowed on the site);
- * assure all medical monitoring has been performed on all abatement workers prior to mobilization to the site;
- * supervise construction of all decontamination facilities and isolation zones in accordance with the CAP;
- * assure adequate supply of all required PPE is available for abatement personnel;
- * prepare and submit schedule of abatement activities;
- * assure all abatement workers sign-in daily at Sudhakar's office (no work will be permitted until worker's have signed in);
- * coordinate abatement activities with Sudhakar's Site Superintendent. No work is to be performed unless authorized by Sudhakar's Site Superintendent and third-party monitoring is available;
- * manage/supervise all abatement activities and assure compliance with procedures in CAP;

- * assure all abated ACM is packaged and stored on site in approved containers/packaging;
- * notify Sudhakar's Site Superintendent when abatement is completed;
- * attend Final Inspection with Sudhakar's Site Superintendent and USACE representatives.

Scott Hammond - Third-Party Monitoring Firm - Chopra-Lee, Inc. - Sudhakar intends to subcontract third-party monitoring and asbestos analysis to Chopra-Lee, Inc. (Chopra-Lee) of Grand Island, New York. Chopra-Lee maintains an Asbestos Handling License, and New York Department of Health ELAP Certificate of Approval. In addition, Mr. Hammond maintains the following training certifications: 1) New York State Asbestos Air Sampling Technician; 2) New York State Asbestos Project Manager; 3) New York State Asbestos Inspector; 4) EPA 40-Hour Hazardous Waste Training; 5) RAD Worker II; and 6) First Aid/CPR Training. Mr. Hammond will be responsible for performing the background samples; prep samples, environmental/work in progress samples; and final clearance samples. In addition, Mr. Hammond will be responsible for providing all asbestos sampling equipment and assuring all equipment has been properly calibrated. Mr. Hammond will be responsible for assuring all sampling and analysis is performed in accordance with the CAP. Mr. Hammond will report to the Site Superintendent.

Safety and Ecology Company (SEC) - Radiological Monitoring - All personnel entering Building 401 will be monitored for radiation as they enter and exit the Building. Sudhakar intends to subcontract radiological monitoring to SEC. All monitoring will be performed in accordance with the Sampling and Analysis Plan (SAP). SEC technicians will report to the Site Superintendent.

SUDHAKAR COMPANY INC.
CONSTRUCTION AND ENVIRONMENTAL DIVISION
ABATEMENT ACTIVITIES IN BUILDINGS 401 AND SURROUNDING AREA
NIAGARA FALLS STORAGE SITE, LEWISTON, NEW YORK
CONTRACT DACW49-03-C-0027
ASBESTOS ABATEMENT ORGANIZATION



3.0 WORK PLAN

This Section discusses specific sequence and methods for ACM abatement.

3.1 Notification Requirements

In accordance with the National Emission Standard for Hazardous Air Pollutants (NESHAP), 54 FR 912 section 112 of the Clean Air Act and New York State Department of Labor (NYSDOL), Title 12, Part 56, 56-1.6(b), 56-1.7, and 56-1.8, a Notification to the USEPA and NYSDOL shall be made 10 days prior to project start. This Notification and any required fees will be submitted by Frontier (abatement contractor) listing USACE as the Owner. The Notification will be sent by certified, return receipt mail or overnight courier. A copy of the Notification and executed delivery receipt or airbill will be submitted to USACE.

3.2 Confirmation Sampling - Mastic

In accordance with Solicitation No. DACW49-03-R-0038, the wooden floor in Rooms 144 and 145 may have ACM mastic ingrained in the wood. Sudhakar must sample the mastic in both rooms and analyze for asbestos. Sampling and analysis will be performed by Chopra-Lee. Samples will be taken by Mr. Scott Hammond, a Chopra-Lee employee with a valid New York State Inspector's certification. Samples will be taken in accordance with the appropriate SW-846 protocol (field determined by Chopra-Lee's technician). Individual samples will be placed in the appropriate container provided by the Contract Laboratory. Sampling date, sample number, sample location, sampling time will be marked on the container with an indelible marker. The sample container will be transported by Mr. Hammond to Chopra-Lee's Grand Island New York laboratory and analyzed for asbestos in accordance with EPA 600/M4/82/020. To assure no cross-contamination, new latex and rubber gloves will be worn for each successive sampling point. Sampling equipment will be cleaned and/or disposed after each sampling event. Discarded sampling equipment will be

placed in double lined plastic bags, labeled and left on site. Bags will be labeled with the following information:

DANGER
CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

Discarded sampling equipment will be disposed with the other waste streams following sampling and analysis. For this CAP, Sudhakar assumes the mastic in Rooms 144 and 145 is ACM and must be abated.

3.3 Personal Decontamination Enclosure System

A single personal decontamination facility will be constructed outside of Rooms 144 and 145. In addition, a single personal decontamination facility will be constructed in Room 119, directly outside of Room 118. Each decontamination facility will consist of: 1) clean room; 2) shower room; and 3) an equipment room. Each room will be separated by an air lock. The decontamination facilities will be constructed in accordance with NYSDOL Subpart 56-9. Any sheeting used for the personal decontamination enclosure system will be at least six-mil opaque, fire-retardant plastic. The shower will be equipped with a water pump filtration system and electric hot water heater (**APPENDIX E**). A large equipment room will be constructed outside of Room 118 to store all drums and containers after they have been HEPA vacuumed (see 3.4).

3.4 Moveable Objects

Room 118 - there are a number of drums and containers in Room 118 that must be removed prior to abatement activities. The drums/containers will be HEPA vacuumed prior to movement to the Personal Decontamination Enclosure System -Equipment Room. The containers/drums will be stored in the Personal Decontamination Enclosure System -

Equipment Room until abatement activities are complete and Personal Decontamination Enclosure System is dismantled. After all abatement is complete the drums/containers will remain in Room 119.

Rooms 144/145 - There are no moveable objects in Room 144/145.

3.5 Pre-Cleaning

All fixed objects, walls, floors, ceilings, etc. in Rooms 118, 144 and 145 /shall be pre-cleaned using HEPA vacuumed.

3.6 Isolation Barriers

Room 118 - the only entrance to Room 118 is through the Personal Decontamination Enclosure System (PDES). The Room 118 entrance will be completely sealed off to the PDES Equipment Room Air Lock. In addition all windows will be sealed with two-layers of at least six-mil opaque, fire-retardant plastic sheeting. Pipe extensions through the walls will be sealed with appropriate caulk/sealant. Since the Room 118 walls, ceilings and floors may be contaminated, they must be cleaned (HEPA vacuumed and wet washed) after all ACM transite and pipe insulation is abated. Accordingly, the walls, ceilings, or floors will not be covered in plastic.

Rooms 144/145 - the only entrance to Rooms 144 and 145 will be through the Personal Decontamination Enclosure System (PDES), which will be located in Room 122. Entrances to Rooms 144/145 entrance will be completely sealed off to the PDES Equipment Room Air Lock. There are no windows in Rooms 144/145. Since the Room 144/145 walls, ceilings and floors may be contaminated, they must be cleaned (HEPA vacuumed and wet washed) after all ACM flooring is removed. Accordingly, the walls, ceilings, or floors will not be covered in plastic.

3.7 Signage

The work areas will be restricted to certified and approved asbestos personnel, from

project start until final clearance sampling has been achieved. Barrier tape imprinted with "Danger - Asbestos" will be installed outside each PDES and all Building 401 entrances. In addition, the following warning signs will be installed:

DANGER
CONTAINS ASBESTOS FIBERS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY

3.8 Engineering Controls

HEPA filtered negative air shall be maintained inside the work area prior to disturbance of ACM until clearance sampling has verified the areas are "clean". Frontier intends to use a Micro-Trap Jr. negative air filtration unit (**APPENDIX F**) to assure contaminated air does not filter back to uncontaminated areas and reduce exposure to abatement personnel. Based on the size of the Rooms (118, 144, and 145) and locations, one Micro-Trap will be set up outside Rooms 144/145 and one Micro-Trap will be set up outside Room 118 to achieve the regulatory requirement of four (4) air changes per hour. Negative air will be maintained 24-hours a day, 7 days a week until final clearance is achieved. If the site experiences power failure, abatement activities will immediately cease and temporary power will be provided, Negative air machines will be vented to the outside of Building 401.

3.9 Work Area Entry and Exit Procedures

All persons shall enter and exit the abatement areas through the PDES. All persons entering the PDES must sign an entry/exit log, located either in, or directly outside the PDES clean room. All personnel entering the abatement area will follow the following procedures:

- enter clean room and remove all street clothing and place in clean plastic bags;
- don: Tyvek suits with head covering and foot coverings; gloves; and NIOSH approved respiratory protection (**APPENDIX G**);

- before leaving abatement area, abatement personnel will remove gross contamination from the outside of respirators and Tyvek suits with a Pullman-Holt wet/dry HEPA Vacuum (**APPENDIX H**) or similar;
- after entering the PDES equipment room, outer layer of Tyvek and gloves will be removed and placed in disposable bags with appropriate warning labels (see Section 3.2);
- after removing gloves and outer layer of Tyvek, abatement personnel will enter shower and clean respirators and any other contamination from inner layer of Tyvek suits;
- after showering, personnel will enter PDES clean room and place inner layer of Tyvek and placed in disposable bags with appropriate warning labels (see Section 3.2);
- personnel will then don street clothes and execute entry/exit log.

3.10 Removal Methods

Room 118 - pipe and/or fitting insulation; transite pipe - Glove bag method will be used to remove the ACM covered pipe/fittings and ACM transite pipe. ACM will be thoroughly wetted with amended water to mitigate release of asbestos fibers prior to, and during abatement. Each glove bag will be used only once. The glove bag should be sealed after it is installed around the pipe to be abated making an airtight fit. Tools required for abatement will be stored in the bag prior to abatement. ACM exposed within the glove bag must be sealed with an encapsulant (**APPENDIX I**) before removing the bag. A visual inspection of the area must be conducted by the Asbestos Supervisor to assure all ACM has been removed prior to removal of the glove bag. Bag will be evacuated and tools removed in accordance with approved methods. Glove bags will be placed in six-mil opaque, fire-retardant plastic bags labeled with appropriate warning (See Section 3.2). appropriately marked asbestos disposal bags.

Room 118 - transite siding - Encapsulant will be placed around fasteners of transite panels prior to removal. Surfaces of panels will be wetted prior to removal. As fasteners are removed, use HEPA vacuum to collect dust. If dust is detected as panels are removed, use HEPA vacuum to collect dust. In the event a panel is broken or deteriorated, apply encapsulant on edges of broken panel. After panels are removed, they will be wrapped in six-mil opaque, fire-retardant plastic sheeting and label with appropriate warning (See Section 3.2).

Room 118 - floor tiles - Since Solicitation does not indicate floor mastic is ACM, only floor tiles will be removed. Floor tiles will be wetted and removed with hand scraper or other hand tool suitable for removing tiles. No grinding or sanding will be permitted. Care will be taken to minimize damage to the tiles during removal and thus mitigate the release of asbestos fibers. Removed tiles will be placed in six-mil opaque, fire-retardant plastic bags labeled with appropriate warning (See Section 3.2).

Room 144/145 - floor mastic - The floor mastic is ingrained in the wood subfloor. Sudhakar intends to remove the entire wood floor in lieu of removing just the mastic. Prior to removal the ACM will be thoroughly wetted with amended water to mitigate release of asbestos fibers prior to, and during abatement. Floor will be removed with hand tools suitable for removing the wood floor. No grinding or sanding will be permitted. After floor is removed, it will be wrapped in six-mil opaque, fire-retardant plastic sheeting and label with appropriate warning (See Section 3.2).

3.11 Clean-Up

After all abatement is completed walls, ceilings and floors in Rooms 118, 144 and 145 will be HEPA vacuumed and wet-wiped. Final clearance samples will then be taken. Air sampling and cleaning will continue until final clearance is achieved. After air sampling verifies all abated areas are "clean", all plastic barriers will be removed and placed in six-mil

opaque, fire-retardent plastic bags labeled with appropriate warning (See Section 3.2). PDES will be dismantled and abatement personnel will demobilize.

3.12 Disposal

All ACM will be placed in plastic bags or wrapping in accordance with Section 3.10 and stored within Building 401. Disposal of ACM wastes will be performed under **Stage 4** of the Contract (Segregation, Packaging, Loading, Transportation, and Disposal of Wastes).

4.0 THIRD PARTY AIR MONITORING

In accordance with NYSDOL 56-17 and OSHA 1926.1101(c), third party air monitoring will be required for this project. Sudhakar intends to subcontract third-party monitoring to Chopra-Lee, Inc. (Chopra-Lee), of Grand Island, New York. **APPENDIX J** is Chopra-Lee's Work Plan, which includes the following:

- proposed types and quantities of samples to be taken for the NFSS project;
- Air Sampling Manual;
- Fiber Air Sampling procedures;
- SOPs for Phase Contrast Microscopy Analysis of Durable Fibers;
- EPA General Air Sampling Guidelines;
- Licenses,
- Laboratory Certifications; and
- Air Sampling Technician Certifications and Qualifications.

Sampling results will be received within 24 hours of delivery. All results will be reviewed by Chopra-Lee's on-site technician with the Site Superintendent and Asbestos Supervisor. If levels of airborne asbestos fibers are detected above regulatory limits or exceed the respiratory protection limits, the project will be shut down until proper engineering controls, modified procedures, or additional respiratory protection is provided.

All abatement facilities (PDES, isolation barriers, signage, etc.) will remain in place until Chopra-Lee verifies that final clearance has been achieved and certifies the site is "clean".

5.0 TRAINING REQUIREMENTS

For asbestos abatement, all abatement personnel (Site Superintendent, Asbestos Abatement Supervisor, Abatement Workers, and Third Party Monitoring Technician) will be required to have the following training:

- Radiation Protection Training meeting CFR Parts 19 and 20;
- 40-hour HAZWOPER Training;
- 8-hour annual refresher HAZWOPER Training;
- Valid New York Department of Labor Asbestos Certificate documenting Asbestos Worker Handler training in accordance with OSHA 29 CFR 1910.1001; and
- on-site abatement manager must possess valid New York Department of Labor Asbestos Certificate documenting Asbestos Supervisor training in accordance with OSHA 29 CFR 1910.1001.

Radiological monitoring technicians will not be required to enter the abatement areas and accordingly, will not require asbestos training. However, due to site history, rad technicians will be required to have the following training:

- Radiation Protection Training meeting CFR Parts 19 and 20;
- 40-hour HAZWOPER Training; and
- 8-hour annual refresher HAZWOPER Training

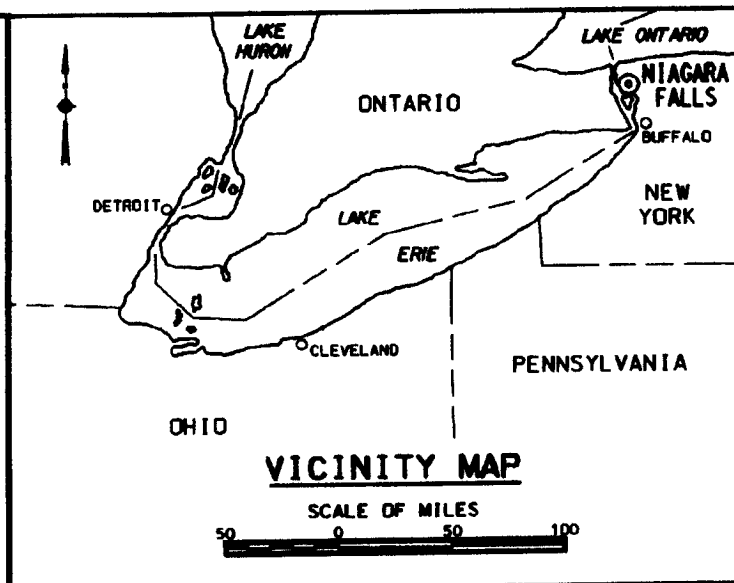
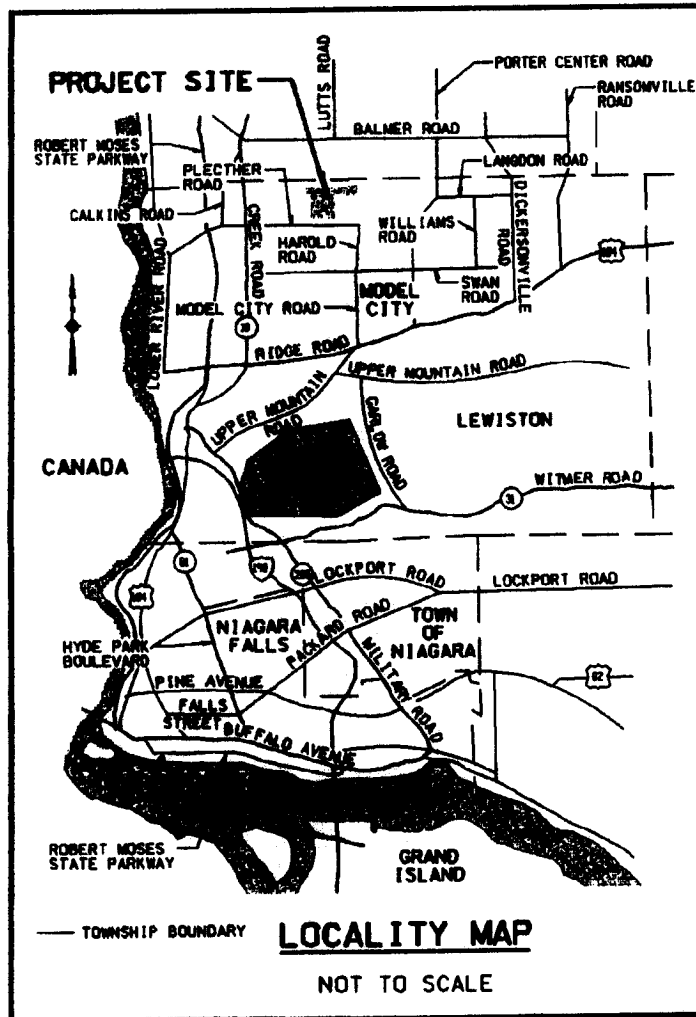
6.0 SCHEDULE

Attached as APPENDIX K is the proposed Project Schedule for abatement activities. It will be modified as necessary if additional cleaning and air sampling is required to achieve final clearance. Note, the entire project is expected to last eleven (11) days from mobilization to demobilization.

7.0 RADIOLOGICAL MONITORING

As previously reported, there are posted areas of elevated radioactivity in soils adjacent to Building 401. In addition, there are areas within Building 401 where radiation levels exceed background levels. Accordingly, to protect Sudhakar personnel and subcontractors, radiological monitoring will be performed during the abatement process. All personnel and equipment will be scanned for radiation levels prior to, and upon exiting Building 401 by a radiological technician in accordance with the Sampling and Analysis Plan (SAP).

**APPENDIX A
SITE MAPS**



NIAGARA FALLS STORAGE SITE
NIAGARA FALLS, NEW YORK
LOCALITY AND VICINITY
MAPS

U.S. ARMY ENGINEER DISTRICT BUFFALO
MAY 2000

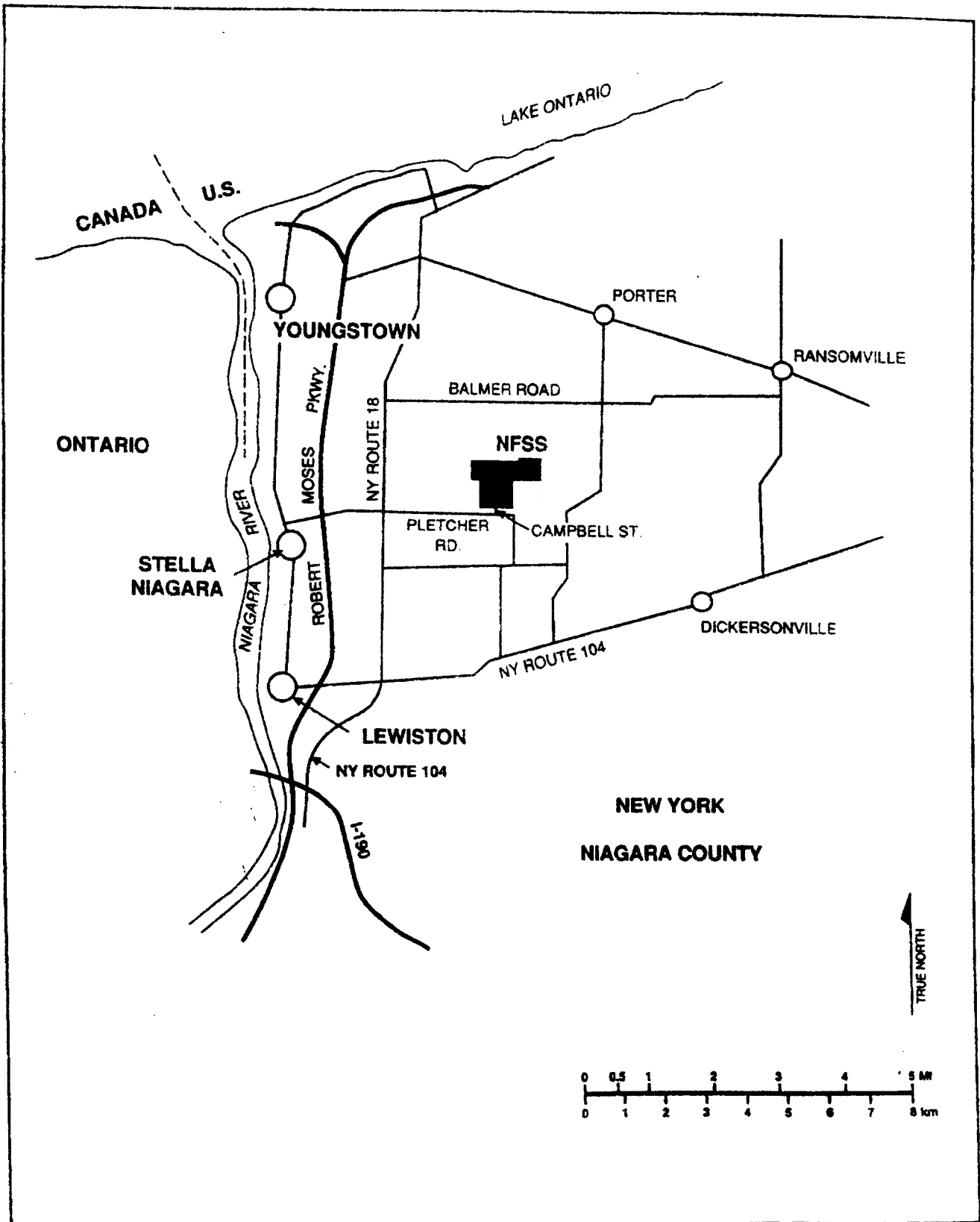
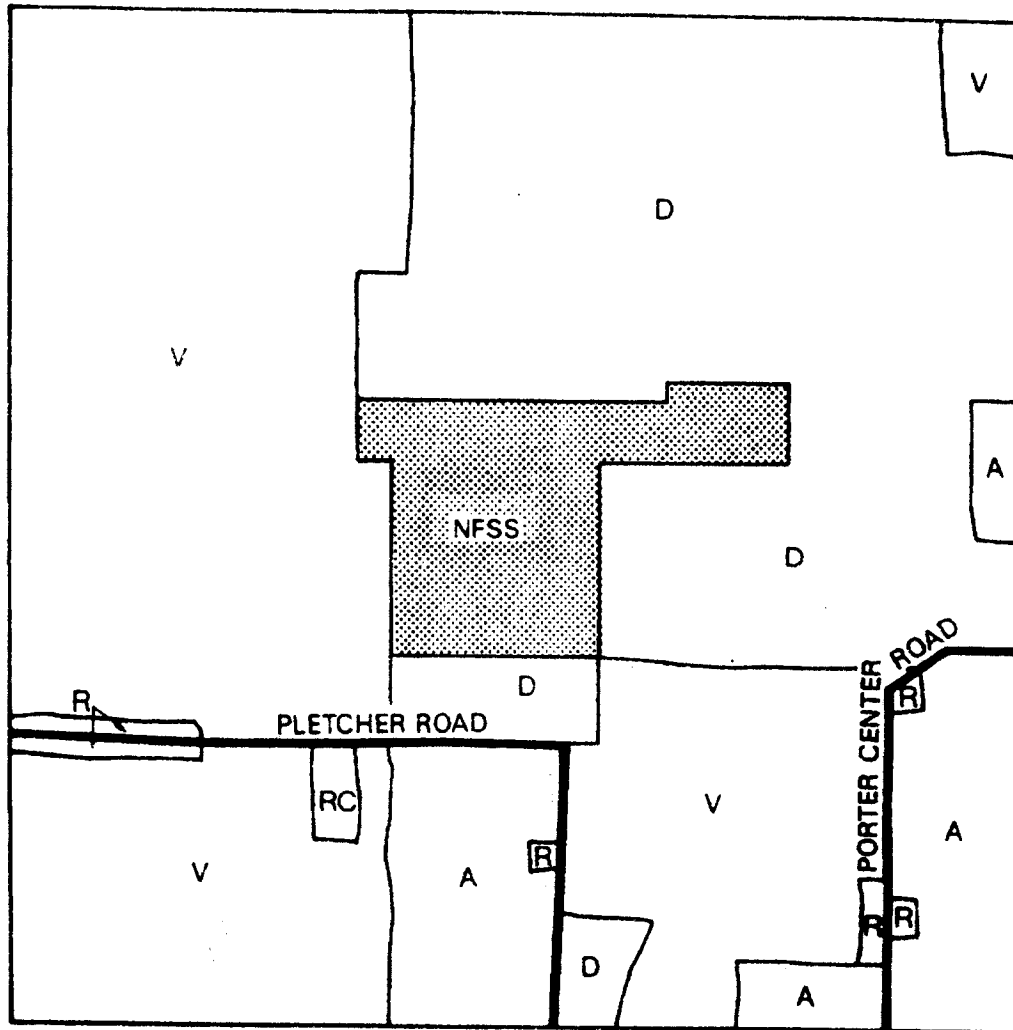


Figure A-1
Location of NFSS



BASED ON AERIAL PHOTOGRAPHS, SITE VISITS, AND USGS TOPOGRAPHIC MAP, 1:24000 SCALE, RANSOMVILLE QUADRANGLE, (PHOTO REVISED 1980)

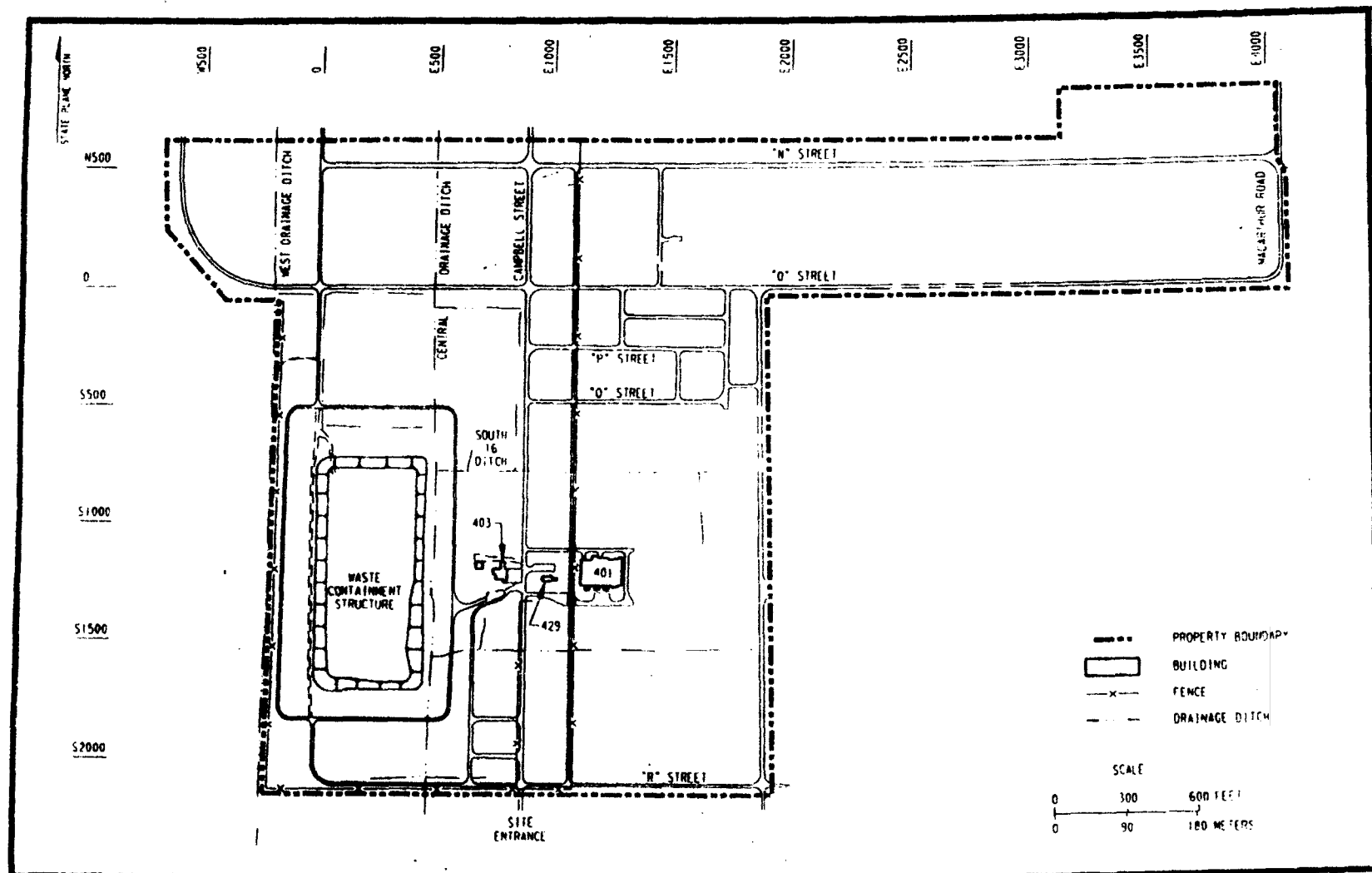
R RESIDENTIAL
RC RECREATIONAL
A AGRICULTURAL

D WASTE DISPOSAL
V VACANT

0 0.5 MI
0 0.8 KM

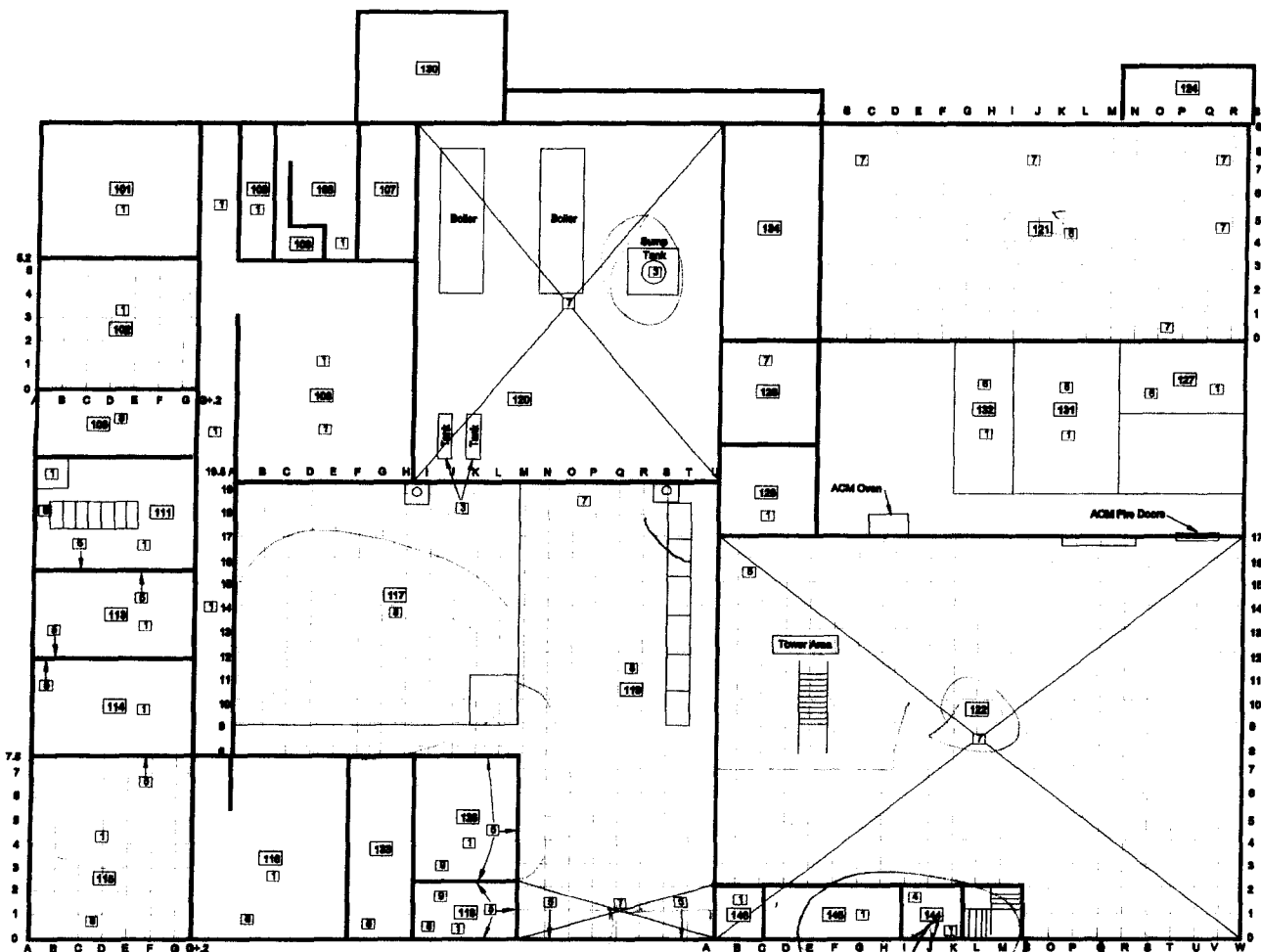


Figure A-3
Generalized Land Use in the Vicinity of NFSS



W 11 002 DGN

Figure A-2
Present Configuration of NFSS



Building 401 - 1st Floor Plan
NTS

General Notes

1. See table one for asbestos containing material (ACM) types and quantities per room location.
2. ACM pipe insulation located above first floor ceilings of location 101, 102, 103, 105, 107, 108. See location 250 on sheet ACML-02.
3. ACM pipe insulation located in chase walls at locations 106, 105, 107.

Legend

- 1 ACM 9"x9" Floor Tile and Mastic and associated Cove Base
- 2 ACM Boiler Insulation
- 3 ACM Tank Insulation
- 4 ACM Bagged Material/Debris
- 5 ACM Transite Wall Panels
- 6 ACM Transite Wall / Ceiling Panels
- 7 Thermal System Insulation Debris
- 8 ACM Pipe and/or Fitting Insulation
- 9 ACM Transite Pipe 10" Ø

1 Square Meter Grid Lines
(Approximate 11 FT²)

122 Room Number

NTS Not To Scale



JACOBS

Building 401 First Floor
Asbestos Containing Material
Location Plan

Niagara Falls Storage Site
Niagara Falls

07/19/02 - 001-01.DWG

Figure ACML-01

APPENDIX B
RESUMES OF KEY PERSONNEL

Daniel E. McGuire
Division Manager

EXPERIENCE SUMMARY

Mr. McGuire has over 15 years of varied environmental and civil engineering experience. During his career, Mr. McGuire has directly managed capital, maintenance and environmental projects valued at over \$100 million. His management responsibilities for these projects include: environmental compliance; engineering; design; cost analysis; contract/subcontract administration; construction supervision; procurement; project management, budgeting and scheduling. Mr. McGuire has been responsible for environmental compliance/control at two steel plants, a consulting firm and remediation firm and has extensive regulatory experience in all media.

EDUCATION Masters Studies - Civil Engineering; **University of Pittsburgh**, Pittsburgh, PA
B.S. - Civil Engineering; **Carnegie-Mellon University**, Pittsburgh, PA

EXPERIENCE **Sudhakar Company, Inc.**, Reading, PA (1994 - Present); Environmental/Construction Division Manager.

Complete responsibility for all projects performed by the Environmental/Construction Division. Projects completed include:

- design and construction of two (2) 1,000,000 gallon-capacity sediment control and supply ponds for U.S. Army Reserves, Fort Indiantown Gap, Pennsylvania;
- remediation of 322,000 pounds of lead-contaminated waste (D008) from 14 Pennsylvania Army National Guard Armory firing ranges;
- 5 year total-grounds maintenance of all U.S. Department of Energy FUSRAP sites in western New York;
- demolition of low-level radioactive contaminated buildings at U.S. Department of Energy FUSRAP site in Middlesex, New Jersey;
- remediation of 48,000 cubic yards of low-level radioactive soil from U.S. Department of Energy FUSRAP site in Maywood, New Jersey;
- 5 year ground-water monitoring program of 150+ VOC-contaminated monitoring wells at Massachusetts Military Reservation, Massachusetts;
- installation/development/monitoring of 200+ VOC-contaminated monitoring wells at Pease AFB, Portsmouth, New Hampshire;
- 5 year hazardous/non-hazardous waste management for 325th Air Squadron Tyndall, Air Force Base, Florida
- over 50 ASTM Phase I, II, and III site assessments/investigations/remediations;
- Pennsylvania Act 2 Release-of-Environmental Liability settlements for a \$21 million shopping mall and \$1 million restaurant/motel located in Reading, Pennsylvania;
- preparation of emission inventories and air permits for various facilities;
- multiple UST/AST remediations; and
- expert environmental witness in various legal cases.

McGuire Environmental Consultants, Wrightsville, PA (1992 - 1994); Principal.

Provided environmental compliance consulting services to industrial, commercial and private clients. Projects included:

- RCRA Facility Investigation of primary steel manufacturer in Burns Harbor, IN;
- ASTM Phase I, II, and III site assessments/investigations/remediations;
- soil remediation (including mercury, lead, and TPH contaminated soil);
- ground water monitoring (well installation, development, sampling, analysis);
- compliance reports (SARA Title III, 25R, 26R, 330, 330-GM, Storm Water annual reports and site inspections, DMRs); and
- environmental permits (air quality, NPDES, storm water NPDES).

EXPERIENCE
(Continued)

Bethlehem Steel Corporation, Steelton, PA (1989 -1992); Manager - Environmental Control.

Complete responsibility for environmental compliance at Bethlehem Steel's 1,500 acre Steelton Plant. Production facilities included electric arc furnaces, rail mill, iron foundry, Frog&Switch mill, and pipe mill. Projects included:

- RCRA Facility Assessment, Investigation, and Remediation of Solid Waste Management Units (SWMUs) at the Plant. Negotiated with EPA to eliminate all but one SWMU for remediation;
- ground-water monitoring (well installation, sampling, analysis, reports, corrective action) of Plant's hazardous-waste and residual-waste landfills;
- design and preparation of Part B applications for hazardous-waste landfill;
- construction of a RCRA cap on closed hazardous-waste landfill;
- asbestos inspections/abatement;
- registration of over 100 ASTs and USTs and closure of six 10,000+ gallon USTs and one 1,000,000 gallon AST;
- development of a drum-management program to track waste generation;
- development of contingency plans (PPC, SPCC, hazardous materials);
- preparation of NPDES permit applications and monthly DMRs;
- Toxics Reduction Investigation as required by NPDES Permit;
- management of all hazardous and non-hazardous wastes generated at the plant including EAF dust, slag, solvents, and lubricants;
- design of air-pollution control systems including baghouses and spray booths;
- preparation of all emission inventories and air permits;
- preparation of all SARA reports;
- management of PCB contaminated equipment;
- wetland delineation of non-industrial area of Plant property;
- risk assessments to reduce remediation liability; and
- acted as Company's liaison to all Federal, State and local environmental regulatory agencies and negotiated all settlements/agreements.

Baker Environmental, Coraopolis, PA (1989); Environmental Engineer.

Staff Environmental Engineer in the Steel Industry Group. Projects included:

- development of spill and contingency plans;
- PCB transformer management;
- design of secondary containment systems;
- development of SARA reports;
- contaminated soil remediation;
- industrial water sewage characterization; and
- waste recycling.

Latrobe Steel Company, Latrobe, PA (1984-1989); Senior Construction Engineer.

Responsible for all environmental compliance and all civil design/construction projects at specialty steel plant. Projects included:

- design of foundations, buildings, roofs, steel structures, roadways (concrete and asphalt), building-crane runways, and re-heat furnaces;
- plant surveys;
- AST and UST installations and closures (acid, bases, petroleum);
- design of acid pickling lines including storage systems (tanks, pumps, secondary containment) for fresh and spent pickle liquor;
- design of on-site residual waste landfill expansion;
- design of all air pollution control equipment including cyclones and baghouses;

EXPERIENCE
(Continued)

- preparation of all environmental permits (NPDES, residual waste landfill, and air quality);
- preparation of all SARA reports;
- preparation of monthly NPDES DMRs;
- development of Right-to-Know program;
- engineering/technical expert on all Company arbitration cases;
- represented Company on Specialty Steel Industry environmental lobby; and
- acted as Company's liaison to all Federal, State and local environmental regulatory agencies and negotiated all settlements/agreements.

ENVIRONMENTAL
CERTIFICATION

OSHA 40 hour hazardous materials handling training
OSHA 8 hour refresher training
Certified Asbestos Inspector
U.S. EPA Lead Inspector/Supervisor Training

ADDITIONAL
TRAINING

Wetlands Regulations, Storm Water Regulations, AST and UST Regulations, Asbestos Regulations (OSHA and NESHAP); Hazardous Response; Right-to-Know; NPDES Regulations, and Clean Air Act Reauthorization.

COMPUTER
SOFTWARE

Proficient with Word, Word Perfect, Excel, MS Project, Power Point, internet research, and e-mail

Neil F. Raddu

165 Bellwood Drive
West Seneca, NY 14224
(716) 825-3876

PROJECT TITLE: Project Superintendent

EDUCATION

Florida Community College of Jacksonville 1988-1990

MILITARY

United States Navy and Navy Reserves 1984-1992

Accomplishments:

Seaman Apprenticeship, Fire Fighter, Signalman A and C School,
Training in Middle East Anti-Terrorism

Honorable Discharge

EXPERIENCE

8/96-present Sudhakar Company, Inc. Buffalo, NY

Project Superintendent responsible for personnel assignments, remediation efforts budgeting and scheduling. Further duties include: equipment operations, training complying with OSHA regulations, technical documentation of concluded work activities, daily briefings and hazardous work permit pre-job briefings. Also responsible for Department of Energy guidelines in accordance with field engineers and radiation control technicians.

1/92-8/96 Integrated Waste Services Buffalo, NY

Asbestos Supervisor responsible for the decontamination / demolition of structures containing hazardous materials, handling hazardous materials, and hazard communication. Also responsible for setting up and running Asbestos projects from air monitoring to removal and final air sampling from the private sector to the State and Government level. Also responsible for tank burning, metal jacketing, reinsulation, heavy equipment operation, hiring / training of other operators / laborers, shipping and receiving, bidding and inspecting.

1/90-1/92 Lash Equipment Corporation Buffalo, NY

Customer Service Group Technician / Supervisor responsible for coordinating, staging tools and equipment as needed for each project, organizing and managing all aspects of shipping and receiving. Further duties include: computer tracking of inventory and quality control to ensure customer satisfaction along with follow up reports.

LICENSES & CERTIFICATES

- OSHA 40 Hour Hazardous Waste Worker
 - Radiological Worker II
 - Asbestos Supervisor
 - Lead Inspector
 - Lead Abatement
 - 40 Hour Hazardous Material Safety Risk Management
 - Safety Leadership Achievement
 - First Aid and CPR certified
 -
-

MICHAEL P. LYNCH
2239 Katherine Drive
Niagara Falls, New York 14304
716 731-3599

PROFESSIONAL EXPERIENCE

August 2003 **Frontier Insulation Contractors, Inc.** 2101 Kenmore Avenue Buffalo, New York
To 14207. *PROJECT MANAGER / ESTIMATOR*
Present Responsibilities include:

- **Estimating Asbestos, Lead and Mold Abatement Projects.**
- **Managing Projects from the bidding stage through completion and project close out.**
- **Staffing, and project coordination with sub-contractors.**
- **Invoicing and compiling close out documentation.**

1990 **Modern Management Group, Inc. d/b/a Modern Refractories Service/Modern**
to **Environmental Service**, 747 Erie Avenue, North Tonawanda, New York 14120
August 2003 *VICE-PRESIDENT/CORPORATE SECRETARY*
Responsibilities include:

- **Vice-President of Operations of the Environmental Division** – Supervise environmental project managers, responsible for negotiating all environmental contracts, securing all permits, licenses and record keeping.
- **Corporate Secretary** – Compiled company policy, rules, regulations and benefits to employees; recorded corporate meeting minutes.
- **Office Manager** – Manage office staff and accounting personnel. Hiring and discharging of employees.
- **Labor Contract Negotiator** - Local 210 Laborers of Buffalo, New York and Local 3 Bricklayers of Buffalo, Niagara Falls and Lockport, New York.
- **Warehouse Manager** - Manage all warehouse personnel, drivers and manufacturing personnel. Implemented manufacturing quality assurance program.
- **Trustee of 750K Pension Plan** – Manage employer sponsored pension plan. Responsible for all reporting and coordinating with investment and Actuary Firms for the plan.
- **Safety and Risk Manager** – Compiled and managed company safety policy including all reporting.
- **Human Resources Manager** – Allocation of Profit Sharing to employees; health insurance administration; unemployment insurance reporting; vacation allocation and payroll.

MICHAEL P. LYNCH

- 1987 **Modern Management Group, Inc. d/b/a Modern Refractories Service/Modern**
to **Environmental Service**, 747 Erie Avenue, North Tonawanda, New York 14120
1989 **PROJECT MANAGER**
Responsibilities included: Managing environmental projects including bidding,
Staffing and invoicing through project completion.
- 1984 **Modern Management Group, Inc. d/b/a Modern Refractories Service/Modern**
to **Environmental Service**, 747 Erie Avenue, North Tonawanda, New York 14120
1986 **LABORER**
Worked as a laborer on various construction projects.

EDUCATION

- 1994-1996 **Erie Community College North Campus**, 6205 Main Street, Williamsville,
New York 14221
Course of Study: Business Management.
- 1977 **Niagara County Community College**, 3111 Saunders Settlement Road, Sanborn
New York 14132
Course of Study: Municipal Police Training Academy graduate.
- 1974 **LaSalle Senior High School**, Military Road, Niagara Falls, New York 14304
High School Diploma.

LICENSES HELD

New York State Asbestos Contractors License.

CERTIFICATES

New York State Asbestos Supervisors Certificate.
Mold Abatement Technician Certification
EPA Lead Supervisor Certification

ORGANIZATIONS

- ◆ Board of Directors of the Construction Industry Employers Association
- ◆ Chairman of The United Way of the Tonawandas Annual Golf Tournament.

REFERENCES

Available upon request.



Statement of Qualifications

Scott Hammond

Project Manager

Mr. Hammond currently performs and or oversees variety of tasks including building surveys and assessments for asbestos, lead, and other hazardous materials, over-site of projects during asbestos abatement, and sampling and health & safety over-site during surface preparation projects on steel structures. Mr. Hammond has been with Chopra-Lee, Inc. since 1995.

Education: AAS Erie County Community College, Construction Technology

Professional Training

- SSPC C-3 Training – Supervisor/Competent Person for Deleading of Industrial Structure
- NYS Asbestos Air Sampling Technician
- NYS/EPA Asbestos Inspector
- NYS Asbestos Project Monitor
- NITON XRF Training
- EPA 40 hr. Haz-Waste Training
- Radiation II Worker Training
- First Aid/CPR Training
- Lead-Supervisor-Competent Person Training

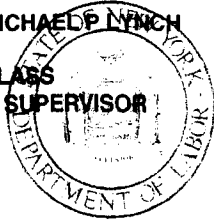
APPENDIX C
NEW YORK STATE ASBESTOS SUPERVISOR CERTIFICATE
MIKE LYNCH (FRONTIER INSULATION CONTRACTORS, INC.)

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE



MICHAEL P. LYNN

CLASS
G SUPERVISOR



CERT# 88-02838

EXPIRES 08/04

MUST BE CARRIED ON ASBESTOS PROJECTS



DMV# 183495326

EYES BLU

HAIR BRO

HGT 5' 10"

IF FOUND RETURN TO:
NYSDEL - L&C UNIT
ROOM 161 BUILDING 12
STATE OFFICE CAMPUS
ALBANY NY 12240

APPENDIX D
NEW YORK STATE ASBESTOS HANDLING LICENSE
FRONTIER INSULATION CONTRACTORS, INC.



STATE OF NEW YORK - DEPARTMENT OF LABOR
DIVISION OF SAFETY AND HEALTH
License and Certificate Unit
BUILDING 12, Room 161
STATE CAMPUS
ALBANY, NY 12240

ASBESTOS HANDLING LICENSE

LICENSE NUMBER: 99-0106

DATE OF ISSUE: 02-27-03

EXPIRATION DATE: 02-29-04

Contractor: Frontier Insulation Contractors, Inc.
2101 Kenmore Ave.
Address: Buffalo, NY 14207

Duly Authorized Representative: William Ketterer

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. The licensee verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Richard Cucolo, Director
FOR THE COMMISSIONER OF LABOR

SH 432 (10-00)

APPENDIX E
SHOWER WATER FILTRATION SYSTEM AND HEATER

S5200 WATER PUMP/ FILTRATION SYSTEM

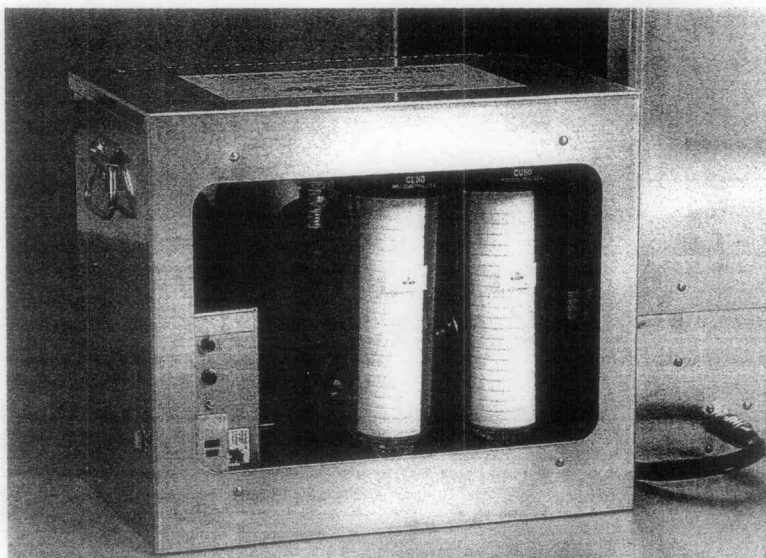
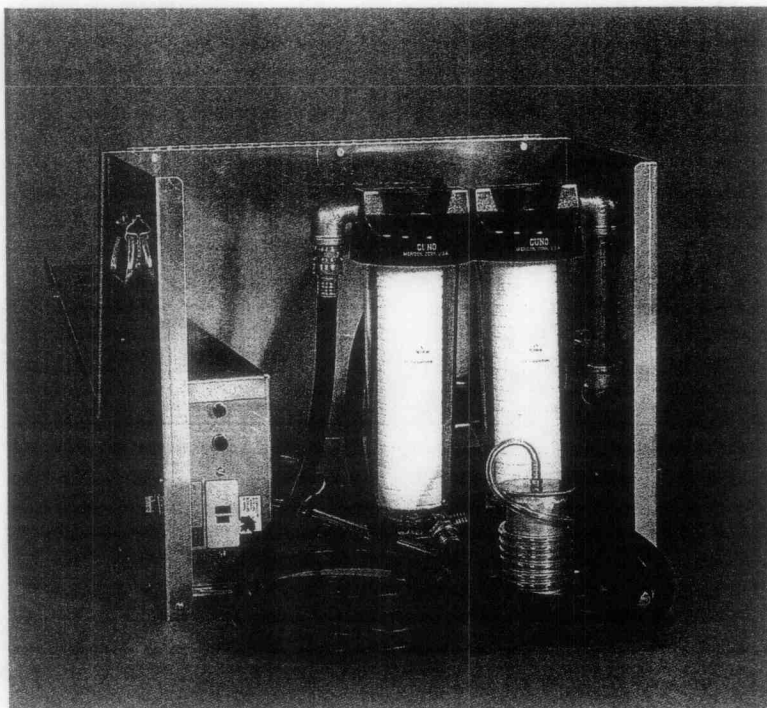
This portable electric pump/filtration device, designed for use with our showers, is constructed from durable marine alloy aluminum.

For safety, all electric components are sealed within a leak-tight compartment. Its $\frac{1}{2}$ horsepower pump can filter up to 6 GPM of contaminated water to 5 microns—enough capacity to filter both compartments of an S5002T dual shower or to simultaneously filter two S5000T or S5100 units.

The S5200 comes standard with 25 and 5 micron high capacity cartridges. Other micron rated cartridges are available as replacement parts. Once initially primed, the system is self-priming as long as water flows through it.

- $\frac{1}{2}$ hp, 20 GPM pump.
- Hinged cover with plexi view window, for filter monitoring and access.
- Built-in GFCI for electrical safety.
- Water level sensor—fits into shower base for automatic activation.
- Push-to-start switch for manual operation.
- Running indicator light.
- 6 ft. inlet and outlet hoses with $\frac{3}{4}$ in. NPT female connections.
- Easy access priming cap.
- Dual carrying handles.
- All electrical components UL listed.
- Weight: 35 lbs.

To Order: Refer to page 28 for complete ordering information.



S5275-10 TANK WATER HEATERS S5275-20

These electric hot water heaters are compatible with our shower systems, and are available in 10 and 20 gallon sizes. Heaters feature specially insulated tanks which reduce heat loss by 25% compared to conventional glass-lined units.

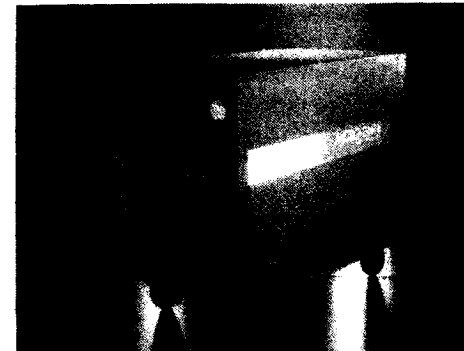
- Run on 120V single phase current.
- Draw 20 amps or less.
- Pressure relief valves and electrical cords are included.
- Larger sizes available by special order.
- Assembly should be done by a licensed plumber or electrician only.

To Order: Refer to page 28 for complete ordering information.



APPENDIX F
MICRO-TRAP NEGATIVE AIR FILTRATION UNIT

The Micro-Trap® Jr.™
Contractor's Model
Negative-Air™ Filtration Unit



**USER'S MANUAL
and
REFERENCE
GUIDE**

Text by Haydon Rochester, Jr.
Illustrations by Michael G. Greninger
Produced by SourceFinders Information Corporation

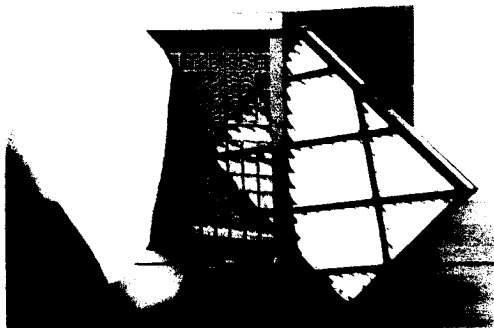
© 1987, Micro-Trap, Inc.
38 North Pine Avenue
Maple Shade, NJ 08052

The Micro-Trap® Jr.™

Contractor's Model

NEGATIVE-AIR™ FILTRATION UNIT

- Negative pressure filtration of 0.3 micron particulates at 99.97% efficiency
- Moves air at 450-1,000 cubic feet per minute
- Only 16 inches wide---fits through narrow openings
- Meets all Federal asbestos abatement standards
- Audible and visible alarms, safety interlock
- Runs on standard 115 volt, 15 amp AC circuits



Micro-Trap products are distributed
exclusively by:

Asbestos Control Technology, Inc.

P.O. Box 183, Maple Shade, NJ 08052
800-221-1911
(In NJ: 609-662-0927)

Ninety Day Warranty

Micro-Trap, Incorporated warrants to the original purchaser that this unit is free from defects in material and workmanship under normal use and service. Micro-Trap's sole obligation under this warranty is limited to the repair or replacement of any part or parts, F.O.B. factory, which prove defective under normal use and service and which Micro-Trap's examination shall disclose to be defective within ninety days from the date of purchase. Micro-Trap's obligation shall be conditioned upon the following: (a) the product is returned to Micro-Trap with shipping charges prepaid, (b) product has not been subjected to misuse or unauthorized modification, alteration or substitution, and (c) no unauthorized repair work has been carried out on the product. Micro-Trap shall not be liable for any damages occurring in transit.

Limitations of Warranty

Other than the foregoing 90 day warranty, the manufacturer makes no warranty whatsoever, either expressed or implied, concerning the use of this unit. THE WARRANTY AND LIMITS OF LIABILITY CONTAINED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All risks as to the results and performance of this unit are assumed by the purchaser, whether the unit is used in accordance with the instructions or not. Neither the manufacturer nor anyone else involved in the design, production, or distribution of this unit shall be liable for any direct, indirect, consequential, or incidental damages arising out of either the appropriate or inappropriate use of this unit. Because laws, policies, and regulations vary from jurisdiction to jurisdiction and from time to time, the manufacturer can make no warranty concerning the agreement between the procedures described herein and any federal, state, or local law, regulation, or policy. It is the user's responsibility to be informed of current health, safety, and environmental regulations and to follow them when using this unit, whether the instructions herein disagree with such rules or not. The instructions and specifications provided herein are subject to change without notice.

Micro-Trap neither assumes nor authorizes any other person to assume for it any liability in connection with the sale of products.

CAUTION: As with all electrical equipment, this unit represents a potential shock and electrocution hazard. Use only a power supply that complies with the National Electrical Code. Keep all connections dry. Extension cords must be grounded, No. 10 type, not exceeding 100 feet (30 m) in length. Use only appropriate filters for the intended filtration task. Do not attempt to bypass any of the safety mechanisms of either the filters or the unit.

Ownership Record

Buyer's Name: _____

Dept./Crew/Section: _____

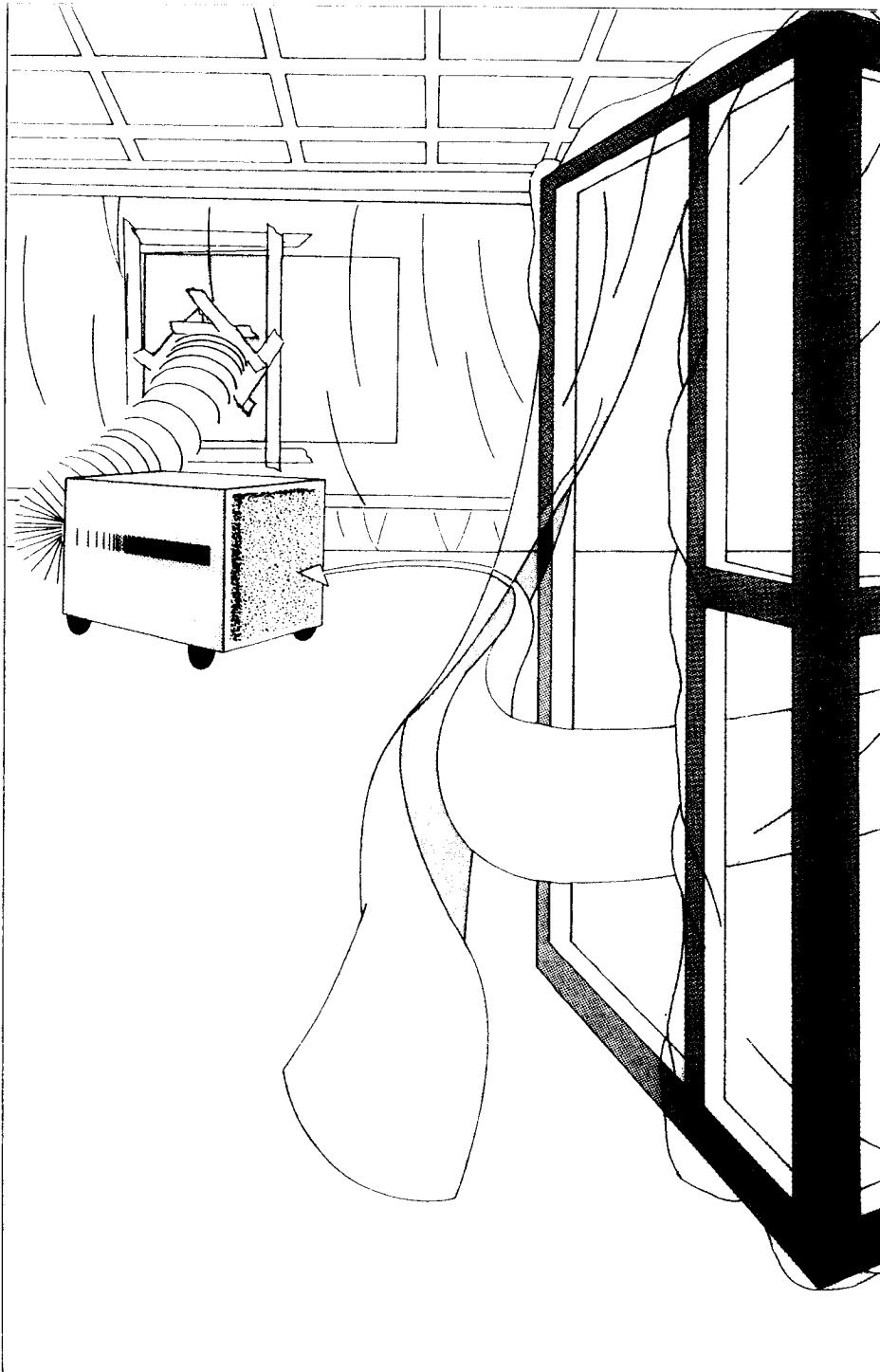
Address: _____

Serial Number: _____ (The serial number of each unit appears in two places: [1] on the shipping carton and [2] on the top, inside surface of the cabinet on the intake end of the unit.)

Date purchased: _____ Date placed in service: _____

Note: The sale of this Micro-Trap® filtration unit does not authorize the purchaser to practice or use the method and/or system disclosed in U.S. Patent NO. 4,604,111. A license is required from the patent owner, GPAC, Inc.

• Made in the United States of America •



Micro-Trap® Jr.

USER'S MANUAL & REFERENCE GUIDE

Table of Contents

General Characteristics of the Unit	6
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USER'S MANUAL

Unpacking and Set-Up	9
Controls and Their Functions	10
Safety Notes	13
Normal Operation	13
Starting and Stopping the Unit	13
Changing Filters	14
Control Panel Displays and Operator Responses	15
Care of the Unit	16
Trouble-Shooting Guide	17

REFERENCE GUIDE

Specifications and Technical Data	22
Operational Characteristics	22
Motor and Blower	26
Electrical & Control Components	26
Cabinet and Related Components	28
Filters Provided with Standard Unit	29
Dimensions of Unit	29
Equipment Return Form	30
Sources of Additional Information	31

General Characteristics of the Unit

The Micro-Trap Jr. is a variable-volume air-moving, HEPA[†] filtration device that captures particulate matter of sub-micron dimensions. Originally designed for the asbestos abatement market, the machines are also used in other segments of industry where airborne particulate contaminants such as fiberglass or ceramic fibers must be controlled.

The Micro-Trap Jr. was designed for use in crawl spaces, man-holes, mechanical rooms, on board ships, and in other cramped spaces. This unit has proven so versatile, however, that many asbestos abatement contractors use it as standard equipment for normal building jobs. The 16-inch-wide Jr. has a blower speed control that allows air delivery to be "fine-tuned" within the range 450-1,000 cfm (cubic feet/minute; 1 cfm = 0.0283 cubic meters/minute).

Air is filtered through three stages of filters, the last of which is a HEPA filter rated at 99.97% efficiency for removal of particulate matter down to 0.3 micron (0.0000118 inch) in size. The Micro-Trap Jr. has a 10-inch (25.4 cm) exhaust collar for 10-inch flexible duct.

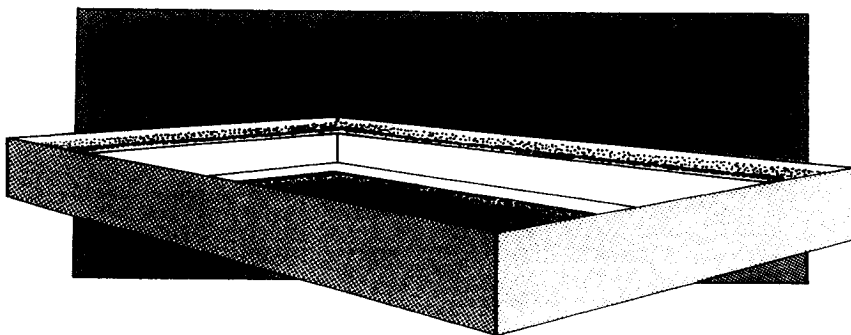
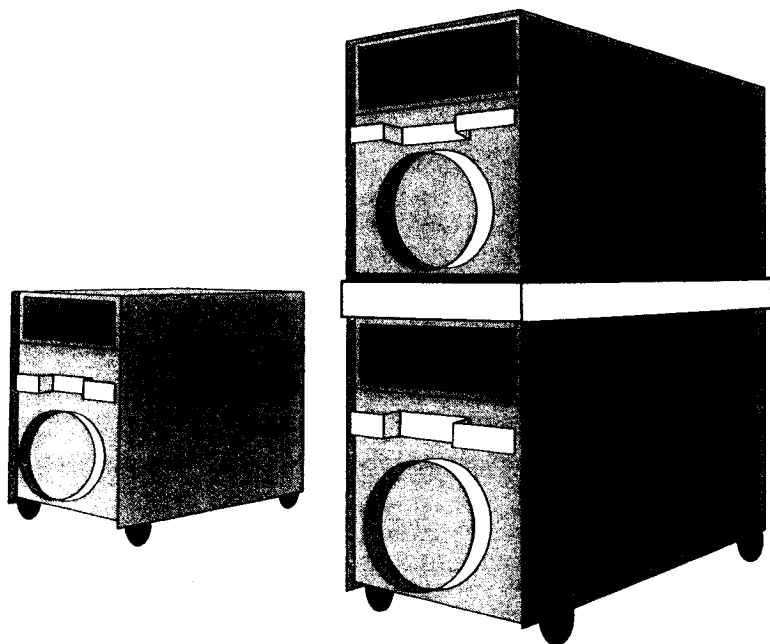
This USER'S MANUAL explains in step-by-step fashion the operation of the Micro-Trap Jr. and the REFERENCE GUIDE provides technical details about the unit's components. Workers on abatement projects normally will need to read only the USER'S MANUAL, whereas contractors, engineers, and architects concerned with planning jobs should be able to find what they need in the REFERENCE GUIDE.

Further sources of information concerning the design, set-up, and operation procedures for pressure-reducing filtration systems for asbestos abatement sites are listed on pages 31 and 32.

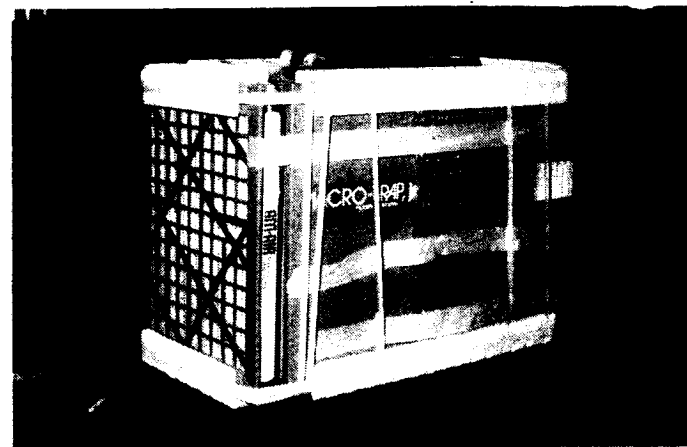
[†]**High Efficiency Particulate Air** (also referred to as High Efficiency Particulate Absolute)

USER'S MANUAL

Micro-Trap Stacking Rings for the Jr.™



It is frequently necessary to use several Negative-Air™ units in a cramped space. Micro-Trap, Inc., offers "Stacking Rings" which allow as many as three Micro-Trap Jr.™ units to be placed one atop the other. These sturdy stacking rings hold wheeled units securely. A stack of three Jr.™ machines can allow up to 3,000 cubic-feet-per-minute of air moving power to be situated in less than five square feet of floor space.



Unpacking and Set-Up

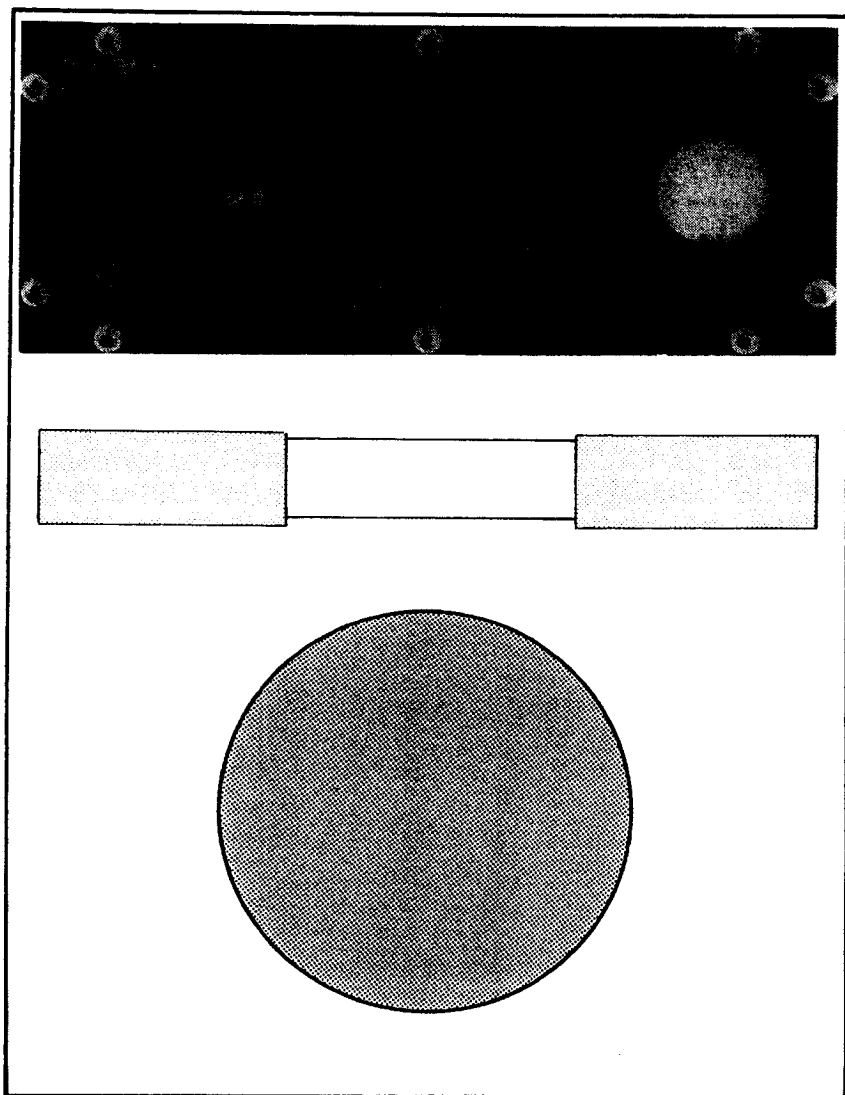
The Micro-Trap Jr. comes from the factory in a cardboard container, protected at vulnerable points by styrofoam padding. One of each type of filter is installed in the unit at the factory.

To unpack the unit:

1. Use a utility knife or single-edged razor blade to cut through the the cardboard box, all the way around at about 2 inches (5 cm) up from the floor. **CAUTION: Do not cut too high up on the box or too deep through the cardboard to avoid scratching the unit's finish.**
2. Lift the cardboard box straight up and away from the unit.
3. With an assistant, lift the machine from the bottom of the box. (Hand-holds are found in the grating at the intake end of the unit; the cord wrap can be used for lifting at the other end.)
4. Check for the presence of the power cord, HEPA filter, secondary filter, and the flexible prefilter. (The HEPA filter may be seen by sliding back the secondary filter. If you wish to remove the HEPA filter, use a 7/16-inch [11 mm] nut driver or adjustable wrench to remove the bolts holding the intake door in place.)
5. If you have not already done so, record the serial number of your unit in the front of this manual and include today's date as the date the unit was placed in service. The serial number is on the top of the cardboard cover and on the top, inside surface of the cabinet on the intake end of the unit.
6. Wrap the service cord around the cord wrap to ensure that it does not become separated from the unit.

Controls and Their Functions

The controls and the response of the unit to each one are explained briefly on the opposite page. Step-by-step instructions are given in the next section, *Normal Operation*. While reading about the controls, new users should feel free to try various control functions as they observe the unit's response.



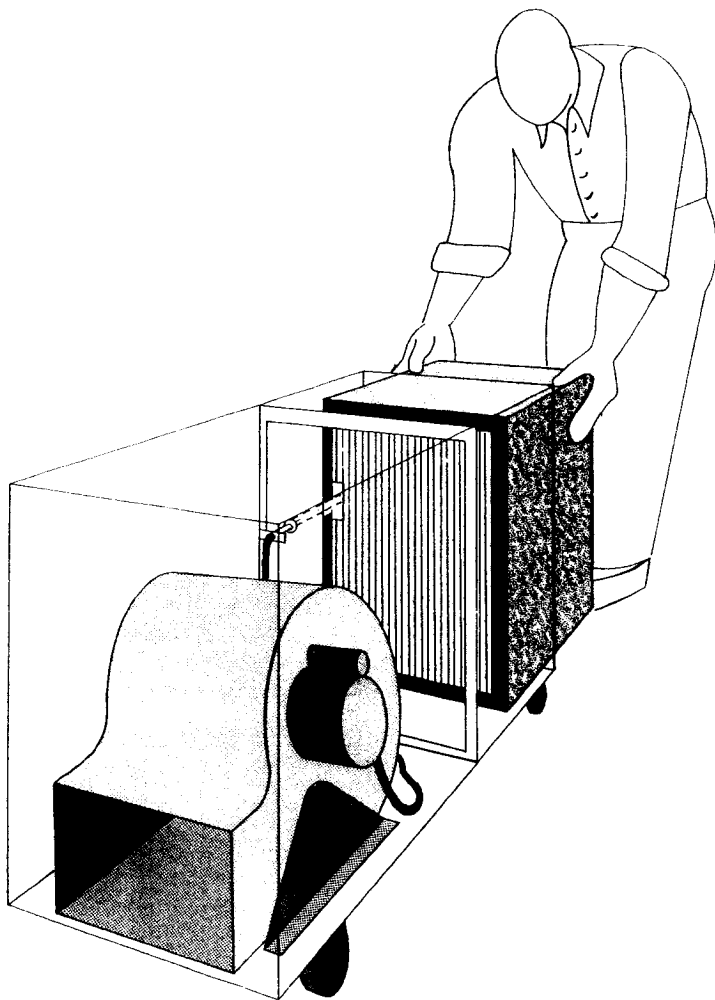
The Micro-Trap Jr.™ Control Panel

Controls and Displays

- (1) **SERVICE CORD RECEPTACLE:** To connect the service cord, align the plug with the three prongs in the connector by gently rotating the plug while pushing it gently into the receptacle. When the plug slides in, push it all the way in and twist it clockwise to lock it in place. Pull straight back on the plug to check for a secure connection.
- (2) **BLOWER SPEED CONTROL:** To adjust the blower speed, turn the knob to the desired position while observing the effect on the **FILTER PRESSURE GAUGE** (9). The changes in static pressure lag slightly behind the movement of the control knob. Turn slowly for best results. **Start unit with knob set for highest speed** (position 10).
- (3) **ON/OFF SWITCH:** Used to start or stop the unit.
- (4) **NORMAL LIGHT (GREEN):** This light is on when the unit is connected to a suitable power source and the switch is ON.
- (5) **DOOR SWITCH LIGHT (RED):** This light comes on when the HEPA filter is missing or improperly installed so that the safety switch is not engaged. (Test this warning system by pulling the HEPA filter 2 inches [5 cm] or so out of the cabinet and trying to start unit.)
- (6) **CLOGGED FILTER LIGHT (AMBER):** This light comes on when the filter is clogged or the intake of the unit is obstructed. (Test this warning system by blocking the intake with a sheet of polyethylene or cardboard when the unit is running normally.)
- (7) **AUDIBLE ALARM:** Sounds when the filter is clogged, intake is blocked, or HEPA filter is not installed correctly.
- (8) **PRESSURE PORT:** This opening allows the pressure sensor inside the unit and the **FILTER PRESSURE GAUGE** to "read" the air pressure in the room. (Never allow the pressure port to become obstructed or gauge readings will be erroneous.)
- (9) **FILTER PRESSURE GAUGE:** This gauge shows the pressure difference between the room air and the downstream side of the HEPA filter in inches of water gauge.* As the HEPA filter becomes clogged with particles, the pressure shown on the gauge increases.

* The pressure sensing system is diagrammed in the REFERENCE GUIDE. To convert **inches of water gauge (W.G.)** to Pascals (Pa), multiply **inches of W.G.** x **248.96**. To estimate air flow in cubic feet per minute or cubic meters per minute based on the readings of the Filter Pressure Gauge, refer to the Fan Curve in the REFERENCE GUIDE.

The Fail-Safe Interlock Feature



The fail-safe interlock is one of the most crucial safety aspects of a HEPA filtration machine. A special switch inside the unit is activated when a HEPA filter is inserted and the filter clip on the gasket side of that filter depresses a spring-loaded HEPA detector switch. If the HEPA detector switch is *not* depressed, the unit cannot be turned on. This prevents the main filter from being installed backwards. It also prevents the unit from being operated when it does not have a main filter in it. This is a very important safety feature because operation of the unit without a main filter, or with the main filter installed in the wrong gasket position, could allow contaminated air to blow freely through the unit to be exhausted into the clean area of a building or the exterior environment.

Normal Operation

Starting and Stopping the Unit

1. Connect the service cord to an appropriate extension if you have not already done so.
2. Connect the cord to the unit. To connect the cord: align the plug with the three prongs in the connector by gently rotating the plug while pushing it gently into the receptacle. When the plug slides in, push it all the way in and twist it clockwise to lock it in place. Pull straight back on the plug to check for a secure connection.
3. Make sure the blower speed control is set at position 10.
4. Turn ON/OFF switch to ON. The blower should start immediately, with the green NORMAL light on.
5. Adjust the blower speed by *slowly* turning the blower speed control knob until the PRESSURE GAUGE shows the desired value. (To obtain a particular level of air delivery, refer to the *Fan Curve* in the REFERENCE GUIDE section of this manual.)
6. To turn the unit OFF, simply turn ON/OFF switch to OFF. The blower will stop and the green NORMAL light will go out.

CAUTION: Use only a 115-volt, 15-amp, single phase, 60 cycle AC grounded outlet, and no more than 100 ft (30 m) of No. 10 extension cord.

Safety Notes

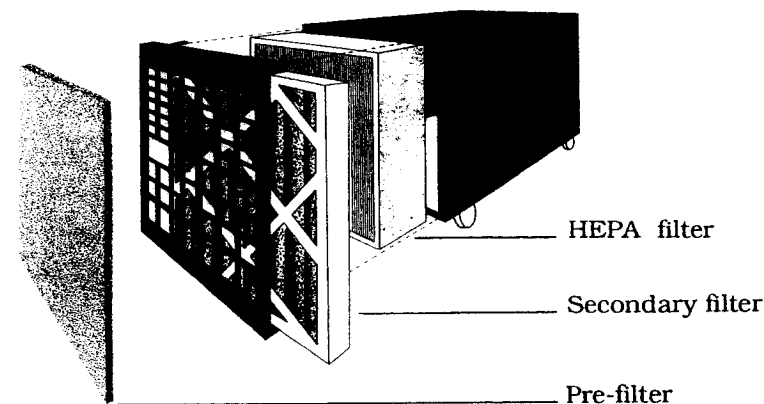
- Power supply must conform to the National Electrical Code (USA).
- Use extension cord of No. 10 size, grounded and not longer than 100 ft (30 m).
- A minimum of 15 amp, 115 volt, single-phase, 60 cycle AC circuit is required for operating this unit.
- Never connect the unit to a circuit that is not grounded correctly; if in doubt, get a qualified electrician to inspect the building wiring.
- Do not attempt to defeat the unit's grounding system by using a 3-wire to 2-wire conversion plug.
- Use appropriate filter media for the filtering task; do not use filters for purposes other than those specified by the filter manufacturer.
- Store the Jr. unit in a dry place; excessive moisture shortens filter life and can adversely affect the unit's operation.
- Turn the unit off and unplug it before changing the main (HEPA) filter.

Changing Filters

Interval *	Action	Steps to Take
Every 20-60 minutes of operation	Replace prefilter	<ol style="list-style-type: none"> 1. Shut off unit† 2. Remove old prefilter 3. Align new prefilter over inlet 4. Press top of prefilter onto velcro strip 5. Restart unit
Once or twice daily, depending on conditions	Replace secondary filter	<ol style="list-style-type: none"> 1. Shut off unit† 2. Slide out old secondary filter 3. Slide in new secondary filter (Be sure to install with arrows pointing in direction of air flow.) 4. Restart unit
After 600-1,000 hours of typical operation	Replace HEPA filter	<ol style="list-style-type: none"> 1. Shut off and disconnect unit 2. Remove prefilter 3. Remove the 4 bolts holding intake door (7/16-inch nutdriver or adjustable wrench required) 4. Remove old HEPA filter (Lift with fingertips while rocking HEPA filter slightly to ease sliding. Prevent unit from rolling by placing toes of shoes against casters.) 5. Slide in new HEPA filter, with gasket side forward (toward motor) and with filter clip aligned with HEPA detector switch inside cabinet 6. Reattach the intake door using the four 7/16-inch bolts (Use the toes of your shoes to bear the weight of the door to make starting the bolts easier. Do not tighten any bolts until all have been started.) 7. Reattach the prefilter 8. Plug in unit and restart

*** IMPORTANT NOTICE:** Filter change intervals given here are for typical job conditions and are intended to keep the Micro-Trap Jr unit running smoothly and extend its service life. Actual job conditions, supervisor's instructions, and/or governmental regulations may dictate different intervals, which should be followed, even if they disagree with the instructions above.

† While it is not strictly necessary to shut off the unit to perform these tasks, it is good practice to do so because the prefilters protect the HEPA filter from becoming clogged by large particles, which would shorten its life. The procedure recommended saves money by preserving HEPA life.



The three-stage filter design of the Micro-Trap serves both efficiency and economy. The inexpensive pre-filter and secondary filter trap larger debris that might otherwise shorten the life of the 12-inch main HEPA filter.

Control Panel Displays and Operator Responses

Display	Cause	Correct Response
NORMAL light on only	Unit operating normally	None required
CLOGGED FILTER light on & BUZZER sounding	Filter clogged or intake obstructed	<ol style="list-style-type: none"> 1. Shut down the unit 2. Follow procedures under <i>Changing Filters</i> to replace clogged filters with new ones (Begin with prefilter and secondary filters first, starting unit after changing each. If light still does not go out, replace HEPA filter.) 3. Restart unit
DOOR SWITCH LIGHT on & BUZZER sounding	HEPA filter improperly installed, defective, or missing	<ol style="list-style-type: none"> 1. Shut down the unit 2. Check for defective or improperly installed HEPA filter (Gasket should be facing away from you as you slide the HEPA filter in, and the filter clip should be on the right-hand side of the HEPA filter.) 3. Reposition the filter properly (see illustration on p. 12) or obtain a new one 4. Restart unit

Care of the Unit

Moving the Unit

No special precautions need be taken to protect the Micro-Trap Jr. during normal moving from one job to another. Care should be taken to restrain the machine from rolling during transport in vans or trucks. The control panel should not be permitted to rub or bump against tools or supplies during transport. Remember to wrap the electrical service cord on each unit before leaving the job site.

CAUTION: If the filters contain toxic materials such as asbestos, they should be removed and disposed of properly before the unit is removed from the containment area. The unit itself should be decontaminated according to approved procedures before it is taken into clean areas. Federal, state, and local regulations may govern the handling of negative pressure filtration units and their filters during transport. These regulations should be known and followed.

Storing the Unit

The Micro-Trap Jr. should be stored away from excessive moisture and corrosive substances. Excessive moisture shortens filter life and can adversely affect the unit's performance.

Maintenance of the Unit

Other than filter changes at appropriate times, there are no maintenance requirements for this unit. Motor and wheel bearings are permanently lubricated and should never be oiled. User replacement of parts may damage the unit or create hazardous operating conditions. Replace damaged or frayed service cords promptly (see your ACTI® catalog).

Instructions for removing the control panel and/or motor in the event they need servicing are given after the *Trouble-Shooting Guide*.

Trouble-Shooting Guide

Problem	Possible Cause	Corrective Action
No response when unit switched ON	A. Bad service cord B. Tripped circuit breaker in building C. Thermal protector on motor tripped	Recheck connections Reset breaker Wait and retry start-up (protector resets automatically)
MT-Jr. chatters on start-up	A. External circuit breaker too small B. Too many units sharing the same line C. Extension cord gauge too small D. Extension cord too long E. Other loads on line F. Starting more than one unit at the same time	Verify at least 15 amp, 115 volt service Connect only 1 unit/line Use only grounded, 3-wire 10 gauge cord Use 100 ft (30 m) max, 10 gauge cord Remove lights, pumps, etc., from same line as unit Allow each unit's blower to achieve full speed before switching ON next unit
DOOR SWITCH light on at start-up	A. HEPA filter installed incorrectly B. Improper HEPA filter being used	Check and correct if needed Use only Micro-Trap® filters with safety-interlock filter clip
CLOGGED FILTER light on at start-up	A. Dirty filters B. Excessive intake resistance C. Vac-attachment problem	Change according to instructions Shorten duct or look for bends, kinks, or obstructions and remove Determine that Micro-Trap® Vac-attachment is being used correctly

Can't Solve The Problem?

If you cannot solve the problem after trying the above suggested actions, call Customer Support at 609-779-1300, or write, explaining the problem with your unit exactly as it occurred, to Customer Service Department, Micro-Trap, Inc., P.O. Box 26, Maple Shade, New Jersey, 08052. Have your unit's serial number and purchase date ready when you call or include these in your correspondence.

Removing control panel for servicing

The control panel contains no user-serviceable components. If a careful check-out by a qualified electrician has shown that the control panel is defective or this is suspected, follow the steps below for removing it and packing it for shipment.

1. Turn OFF unit and disconnect it from the power source.
2. Remove the screws (Phillips head) holding the panel and save both screws and sealing washers.
3. Slide the panel out of the cabinet; the lower edge should be pulled out first. After you have pulled the lower edge out, slide the panel slightly downward before pulling the top edge out. This permits the interior pressure port to clear the opening in the cabinet.
4. Remove the back panel plate.
5. Disconnect the door switch (HEPA detector) from its mounting bracket.
6. Loosen the motor lead strain relief connector.
7. Disconnect the motor lead wire from the panel and slide through the strain relief connector in the back panel plate. (Mark motor wires with tape tags to indicate how they connect to panel.)
8. Leave door switch lead attached when sending panel for service.

To reinstall the repaired control panel, follow the steps 1-7 in reverse. **(WARNING: Never attempt to connect the control panel unless the switch is OFF and the service cord is disconnected.)**

Removing the motor/blower assembly for servicing

1. Remove the control panel from the unit (see above).
2. Disconnect motor lead wires from panel after tagging connection points on panel wiring.
3. Remove front door and HEPA filter. **(WARNING: If HEPA filter is contaminated, remove and store safely before proceeding.)**
4. With a 7/16-inch [11 mm] open wrench, remove the two bolts and nuts from the *discharge side* of the blower mount to cabinet.
5. With a 7/16-inch [11 mm] open wrench, remove the two bolts and nuts from the *filter side* of the blower mount to cabinet.
6. Slide blower/motor assembly from the cabinet.
7. Do not attempt to separate the motor from the blower, even if you are sure which part is defective. Send the whole motor/blower assembly for service as a unit.

To install a new or repaired motor, follow steps 1-6 above in reverse order. When motor/blower is reinstalled, blower discharge must compress gasket connection to cabinet. **(WARNING: Never attempt to connect the motor unless the switch is turned OFF and the service cord has been disconnected.)**

Packing components for shipment (See "Return Form" page 30)

When returning components for repairs, be sure to pack them in sturdy containers, with adequate padding (plastic bubble sheets, crumpled heavy polyethylene, or crumpled heavy paper) surrounding each item on all sides. The packed component should not be able to slide back and forth within the box when it is shaken. The manufacturer cannot be responsible for damage occurring during shipment, so pack all items with care.

Send all items with the shipping prepaid unless prior arrangements have been made with a service representative. No C.O.D.s will be accepted. Returns must be authorized by Micro-Trap, Inc., and accompanied by an equipment return form (see page 30 for a blank form). Address packages as follows:

**Customer Service Department
Micro-Trap, Inc.
38 North Pine Avenue
Maple Shade, NJ 08052**

REFERENCE GUIDE

Specifications and Technical Data

Operational Characteristics

Air flow: 450-1,000 cfm [12.7-28.3 cu m/min] with factory-supplied filters

Air inlet area: 235.2 square inches [1,517 sq cm]

Air inlet dimensions: 17.75 x 13.25 inches [45.1 x 33.7 cm]

Air movement capacity: 6,750-15,000 cubic feet [190-420 cu m] in 15 minutes with factory-supplied filters

Air outlet area: 35.43 square inches [228 sq cm] (Duct collar area: 78.5 square inches [507 sq cm])

Air outlet dimensions: 6.75 x 5.25 inches [17.1 x 14.0 cm] (Duct collar diameter: 10 inches [25.4 cm])

Ambient temperature limits for unit operation: 4 °F [-20 °C] -- 104 °F [40 °C]

Area covered per single Micro Trap Jr. unit (assuming 450-1,000 cfm flow rate; back-up machines not considered in calculations):

Ceiling Height		Area covered @ 4 air changes/hr		Area covered @ 6 air changes/hr	
ft	m	Sq ft	Sq m	Sq ft	Sq m
6	1.8	1,125 - 2,500	106 - 233	750 - 1,667	71 - 157
7	2.1	964 - 2,143	90 - 200	643 - 1,429	60 - 135
8	2.4	844 - 1,875	79 - 175	563 - 1,250	53 - 118
9	2.7	750 - 1,667	70 - 147	500 - 1,111	47 - 105
10	3.0	675 - 1,500	63 - 140	450 - 1,000	42 - 94
12	3.7	562 - 1,250	51 - 113	375 - 833	34 - 76
14	4.3	482 - 1,071	44 - 98	321 - 714	29 - 66
16	4.9	423 - 983	39 - 86	281 - 625	26 - 58
18	5.5	375 - 833	34 - 76	250 - 556	23 - 51
20	6.1	338 - 750	31 - 69	225 - 500	21 - 46

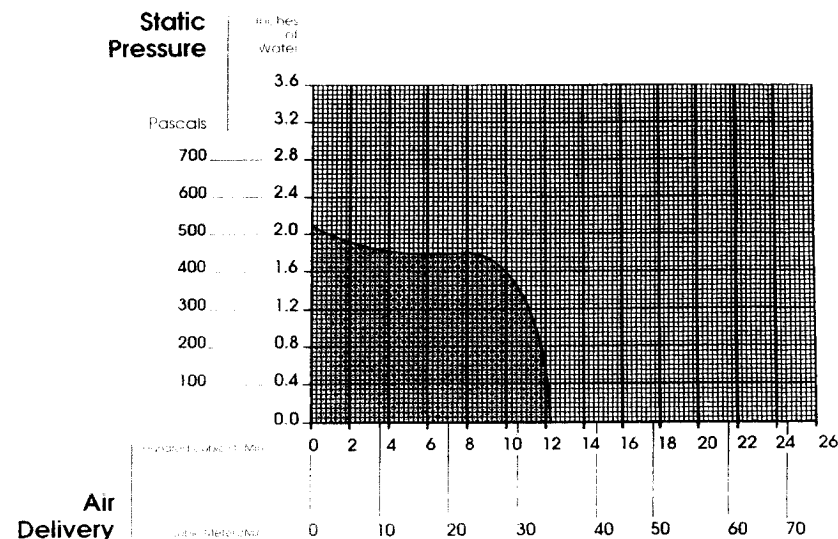
Audible warning tone: 2,800 ± 500 Hz, 90 dB (min.) at 12 V DC at 11.75 inches [30 cm]

Blower performance during normal operation (see Fan Curve on opposite page)

Duct collar area: 78.5 square inches [506.7 sq cm]

Duct collar diameter: 10 inches [25.4 cm]

Fan Curve for Micro-Trap Jr. Blower at 1,725 revolutions/minute



To estimate the air flow from static pressure:

- [1] Observe the static pressure shown on the unit's gauge
- [2] Find the point on the static pressure curve that matches the static pressure as given by the unit's gauge reading
- [3] Follow the grid line straight down from this point on the curve to locate air flow from the air delivery scale.

(In the example shown, a static pressure of 1.5 indicates an air flow of 800 cfm.)

Filter pressure warning set at factory: 1.7 inches of water [420 Pa]

Filter pressure gauge readings:

Full range of gauge: 0-2 inches of water [0-500 Pa]

With unobstructed, new HEPA filter: 0.85 inches of water [210 Pa] (with fan control set at 10 [full power])

At filter pressure warning: 1.7 inches of water [420 Pa]

Particles filtered:

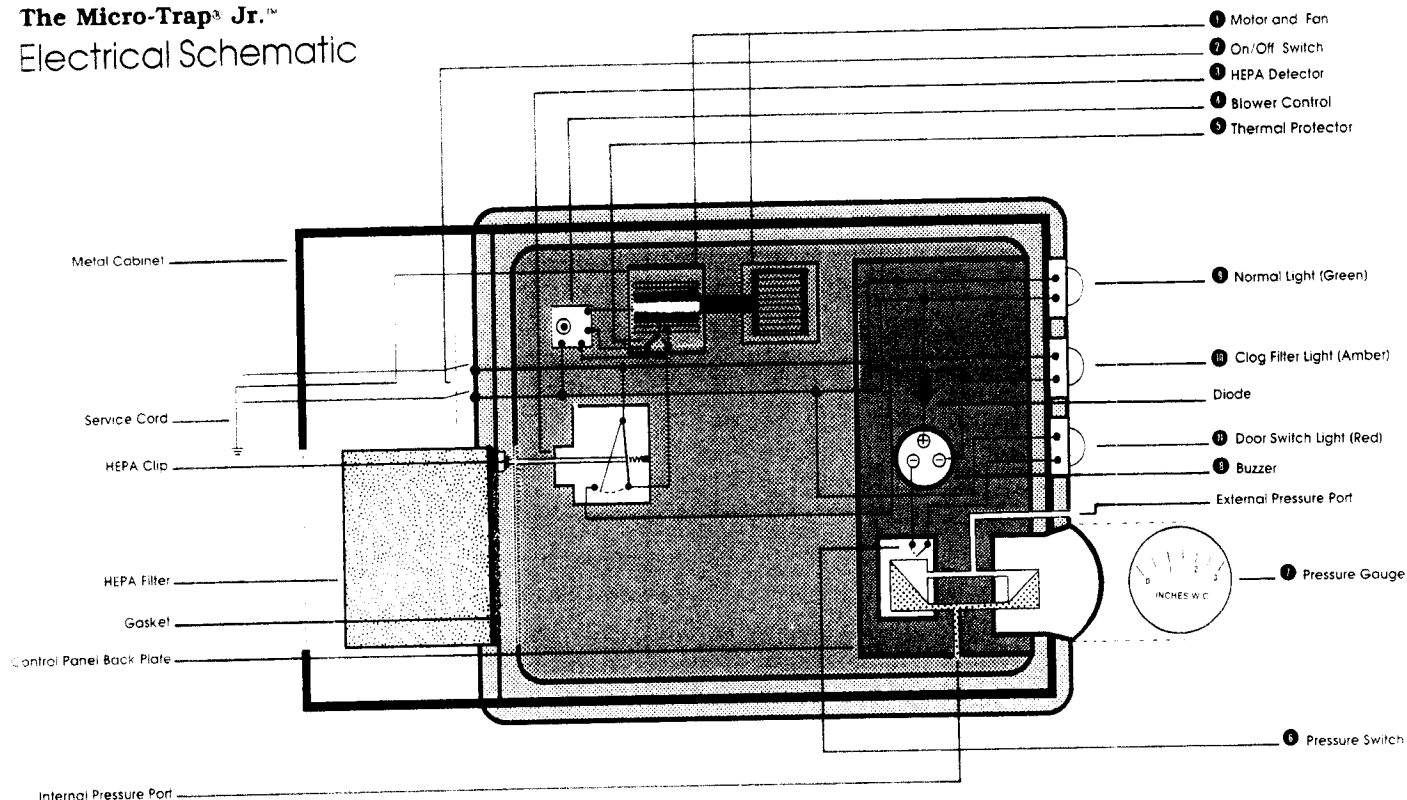
Prefilter (#3): large flakes and chips, visible dust

Secondary filter (#2 prefilter): particles larger than 10 micron [0.00039 in] at 90% efficiency

HEPA filter: particles larger than 0.3 micron [0.0000118 in] at 99.97% efficiency

Power supply requirements: 115 volts, 15 amperes, single-phase, 60 cycles A.C. (unless differently configured by special order to the factory)

The Micro-Trap[®] Jr.[™] Electrical Schematic



STATUS OF UNIT

CONDITION	(1) Blower	(2) ON/OFF Sw.	(3) HEPA Det.	(4) Blower Control	(5) Therm. Prot.	(6) Press. Sw.	(7) Press. Gauge	(8) Buzzer	(9) Normal Light	(10) Door Sw. Lt.	(11) Clog. Fil. Lt.
Unit in normal shutdown status	OFF	OFF	ON	"0-10"	ON	OFF*	"0"	OFF	OFF	OFF	OFF
Unit powered, operating normally	ON	ON	ON	"5-10"	ON	OFF*	"0.8-1.6"	OFF	ON	OFF	OFF
Unit powered, little or no air at outlet	ON	ON	ON	"0-4"	ON	OFF*	"0"	OFF	ON	OFF	OFF
Unit powered, HEPA absent or incorrectly inserted	OFF	ON	OFF	"0-10"	ON	OFF*	"0"	ON	ON	ON	OFF
Unit powered, filter(s) clogged	ON	ON	ON	"0-10"	ON	ON*	"1.7"	ON	ON	OFF	ON
Unit powered, motor overloaded	OFF	ON	ON	"0-10"	OFF	OFF*	"0"	OFF	OFF	OFF	OFF
Power failure outside unit (e.g., unplugged extension or breaker tripped in building)	OFF	ON	ON	"0-10"	ON	OFF*	"0"	OFF	OFF	OFF	OFF

* "OFF" = a reading of < 1.7 inches of water gauge [<420 Pa]; "ON" = a reading of 1.7 inches of water gauge [422 Pa].

Motor and Blower

Component	ACTI Part Number
Blower, 1,200-cfm, permanent split capacitor, with 1.0 HP, 1,725 rpm, ball-bearing motor with automatic thermal protector; 115 V, 60/50 Hz	30813
Blower housing supports (1 pair), gray enamel finish	30814
Capacitor, 704 microfarad	30749

Electrical and Control Components

Component	ACTI Part Number
Differential pressure gauge, range: 0-2 inches of water [0-500 Pa]	30815
Differential pressure sensor, actuated at 1.7 inches of water [420 Pa]	30816
Diode (1 ampere, 400 V, NPN)	30791
Blower control (motor speed controller) 115 V AC, 10 amp max., 60/50 Hz	30817
HEPA detector switch, heavy duty precision, snap action plunger	30792
Lamps, warning:	
Clogged filter (Amber)	30794
Door switch (Red)	30793
Normal (Green)	30795
Piezo alerting buzzer (12 V DC)	30772
Pressure port fitting (2) brass	30796
Pressure system tubing, polyethylene, 3/16 inch [4.8 mm] inside diam.	30797
Service cord, 8-ft [2.4 m], 12-gauge, 3-wire, multistrand copper, ST M/E	30743

Electrical and Control Components, continued

Component	ACTI Part Number
Service cord plug, locking, 15 amp, 125 V	30787
Service cord receptacle, locking (in control panel), 15 amp, 125 V	30782
Toggle switch (ON/OFF)	30723
Wiring (control panel to HEPA detector, control panel to motor, and inside control panel)	**

** None of the wiring connecting the components of the Micro-Trap Jr. should be changed or repaired by the user. If a defect is suspected in the wiring connecting the components or within the components themselves, send the entire item for service (see instructions in USER'S GUIDE, p. 18).

Cabinet and Related Components

Component	ACTI Part Number
Blower mounting screw (4), 1/4 inch x 20 x 3/4 inch [19 mm], sheet metal type (7/16-inch [11 mm] hex head)	30798
Cabinet, 16-gauge steel, welded, one-piece; bright blue textured finish meets Federal Spec. 595-25183	30818*
Cabinet door (intake), 16-gauge steel; with 3/4-inch [19 mm] wide velcro filter attachment strip and 3/4-inch wide rubber sealing strip; bright blue textured finish meets Federal Spec. 595-25183	30819*
Caster (4), 3.5-inch [8.89 cm] molded rubber wheel, with chrome plated steel swivel plate	30725
Control panel and back plate, steel, with black enamel finish and rubber sealing strips	30820*
Control panel mounting screw (10), 3/4-inch [19 mm] Phillips head, sheet metal type	30821
Control panel sealing washer (10), 3/8-inch [10 mm] diam., rubber	30822
Cord wrap, 1/8-inch [3.2 mm] thickness bent steel; bright blue finish meets Federal Spec. 595-25183	30823*
Door attachment bolt (4), 1/4 x 3-inch [6 x 76 mm] (7/16-inch [11 mm] hex head)	30824
Door bolt washer (4), 1/2 inch [12.5 mm] flat nylon	30825
Stress relief connector (2), plastic, with rubber gasket; 1/2-inch [12.5 mm], for use with 0.5-0.635 inch [12.5-16 mm cords] (seal openings in control panel back plate for HEPA detector and motor leads)	30807

*Denotes part custom-made for Micro-Trap, Inc.

Filters Provided with Standard Unit

Component	ACTI Part Number
HEPA filter†, particle-board and aluminum frame, with 3/4 x 3/16 inch [19 x 4.8 mm] gasket and 16-gauge galvanized steel filter clip; 99.97% minimum efficiency in filtering 0.3-micron [0.0000118-in] particles, 14 x 20 x 11.5 inches [35.6 x 51 x 29 cm]	30627
Prefilter [#3], 100% polyester, high loft pad, 16 x 20 x 1/2 inches [41 x 51 x 1.25 cm]	30625
Secondary filter [#2], pleated polyester/cotton panel, with beverage board frame; 90% efficiency in filtering 10-micron [0.00039-in] particles, 16 x 20 x 2 inches [41 x 51 x 5 cm]	30626

Dimensions of Unit

	Crated	Uncrated
Height from floor	28.25 inches [72 cm]	25.75 inches [65 cm]
Length	36 inches [91 cm]	33.5 inches [85 cm]
Width	18.75 inches [48 cm]	16 inches [41 cm]
Weight	125 lb [57 kg]	115 lb [52 kg]

†Micro-Trap filters exceed the requirements of Environmental Protection Agency (USA) Report No. 560/5-83-002; Sect. F.2.1.2.2.

APPENDIX G RESPIRATORS

Comfo Classic® Respirators

One of the most comfortable respirators you can buy

The Comfo Classic Respirator is an improved version of the Comfo II Respirator, featuring new SoftFeel™ facepiece material, which increases the comfort factor dramatically.

A result of extensive materials research by MSA, SoftFeel material is an exclusive new formulation that improves the pliability and softness of both Hycar rubber and silicone—the two facepiece materials available with Comfo Classic Respirators. Like earlier Comfo respirator models, the Comfo Classic Respirator features a unique face seal design that gives wearers an exceptional fit.



Comfo Classic Respirators

Material	Color	Small	Medium	Large
SoftFeel Hycar	Black	808075	808074	808076
SoftFeel Hycar	Green	808078	808077	808079
SoftFeel silicone	Black	808072	808071	808073
SoftFeel silicone	Yellow	808081	808080	808082

Comfo Classic Respirators—Bulk (36/pkg)

Material	Color	Small	Medium	Large
SoftFeel Hycar	Black	808697	808699	808701
SoftFeel silicone	Black	808703	808704	808705

Belt-Mounted Comfo Classic Respirators

Material	Color	Small	Medium	Large
SoftFeel Hycar	Black	808431	808423	808439
SoftFeel silicone	Black	808434	808426	808442

Back-Mounted Comfo Classic Respirators

Material	Color	Small	Medium	Large
SoftFeel Hycar	Black	808461	808453	808469
SoftFeel silicone	Black	808464	808456	808472

Type F Dust and Mist Filter Comfo Classic Respirators

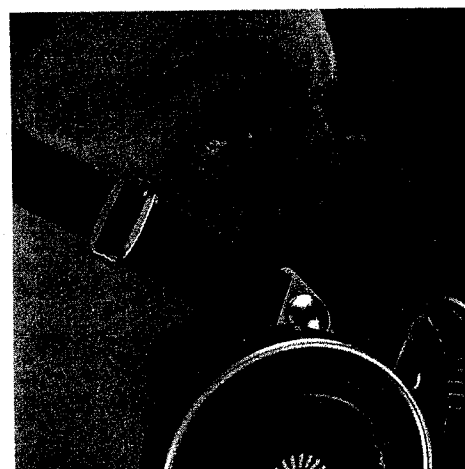
Complete with ten Type F filters and two covers.

Material	Color	Small	Medium	Large
SoftFeel Hycar	Black	808326	808323	808329
SoftFeel silicone	Black	808327	808324	808330

Paint Spray Comfo Classic Respirator Assemblies

Complete with two chemical cartridges, two prefilters and two filter covers.

Material	Color	Small	Medium	Large
SoftFeel Hycar	Black	808540	808537	808543
SoftFeel silicone	Black	808542	808539	808545



This Comfo Classic Respirator features a textured sealing surface of SoftFeel silicone which ensures a comfortable, secure fit.
























Dust and Mist Respirator



Paint Spray Respirator

For more complete information, see Data Sheet 10-02-03.

Comfo® Respirator Filter/Cartridge Ordering Information

MSA Purifying Element	Purifying Protection Code	Color Coding	Respiratory Protection	Part No.	No. in Box	NIOSH Approval
Type F	DM		Approved for dusts and mists having a TWA not less than 0.05 mg/m ³ or 2 million particles per cubic foot. ¹ <i>Note: This filter may also be used as a prefilter with GMA, GMB, GMC, GMD, GME and GMF cartridges and is retained in place by the filter cover.</i>	459595 459693	10 100	TC-21C-133
				489353 Filter Cover (2 required)		
Type S	DFM		Approved for dusts, fumes and mists having a TWA not less than 0.05 mg/m ³ or 2 million particles per cubic foot; radon daughters attached to the dusts, fumes and mists described above. ¹	464034	10	TC-21C-134
Type H	HEPA		Approved for dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides. ^{1,5}	464035 807013	10 100	TC-21C-135
LowRider™	HEPA		Approved for dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides. ^{1,5}	807482	10	TC-21C-135
Sparkfoe® Type H	HEPA		Approved for dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides. ^{1,5}	465798	10	TC-21C-135
GMA	OV		Approved for organic vapors. ^{2,3,4}	464031 807014	10 100	TC-23C-40
GMA-F	OV/DM		Approved for organic vapors; dusts and mists having a TWA not less than 0.05 mg/m ³ or 2 million particles per cubic foot. ^{2,3}	464023	10	TC-23C-151
GMA-H Standard	OV/HEPA		Approved for organic vapors; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides and pesticides. ^{2,3,5}	464029	6	TC-21C-155
GMA-H ShortStack	OV/HEPA		Approved for organic vapors; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides and pesticides. ^{2,3,5}	809102	6	TC-21C-155
GMB	AG		Approved for chlorine, chlorine dioxide, hydrogen chloride, sulfur dioxide and escape only from hydrogen sulfide. ^{2,4}	464032	10	TC-23C-41
GMB-H Standard	AG/HEPA		Approved for chlorine, chlorine dioxide, hydrogen chloride, sulfur dioxide, and escape only from hydrogen sulfide; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; and radionuclides. ^{2,5}	464028	6	TC-23C-150
GMB-H ShortStack	AG/HEPA		Approved for chlorine, chlorine dioxide, hydrogen chloride, sulfur dioxide, and escape only from hydrogen sulfide; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; and radionuclides. ^{2,5}	809103	6	TC-23C-150
GMC	OV/AG		Approved for organic vapors; chlorine, chlorine dioxide, hydrogen chloride, sulfur dioxide and escape only from hydrogen sulfide. ^{2,3,4}	464046 807015	10 100	TC-23C-47
GMC-S	OV/AG/ DFM		Approved for organic vapors; chlorine, chlorine dioxide, hydrogen chloride, sulfur dioxide, and escape only from hydrogen sulfide; dusts, fumes and mists having a TWA not less than 0.05 mg/m ³ or 2 million particles per cubic foot; radon daughters attached to dusts, fumes and mists described above. ^{2,3}	464033	6	TC-23C-154
GMC-H Standard	OV/AG/ HEPA		Approved for organic vapors; chlorine, chlorine dioxide, hydrogen chloride, sulfur dioxide, and escape only from hydrogen sulfide; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides. ^{2,3,5}	464027 807012	6 50	TC-23C-153
GMC-H ShortStack	OV/AG/ HEPA		Approved for organic vapors; chlorine, chlorine dioxide, hydrogen chloride, sulfur dioxide, and escape only from hydrogen sulfide; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides. ^{2,3,5}	809104	6	TC-23C-153
GMD	AM		Approved for ammonia and methylamine. ^{2,3,4}	464033	10	TC-23C-43
GMD-H Standard	AM/MA/ HEPA		Approved for ammonia and methylamine; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides. ^{2,3,5}	464030	6	TC-23C-152
GMD-H ShortStack	AM/MA/ HEPA		Approved for ammonia and methylamine; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos-containing dusts and mists; radionuclides. ^{2,3,5}	809105	6	TC-23C-152
GME	OV/AG/ AM/MA/ HF/FORM		Approved for organic vapors, chlorine, hydrogen chloride, sulfur dioxide, ammonia, methylamine, pesticides (when used with paint/pesticide prefilter); paint, lacquer and enamel mists (when used with paint/pesticide prefilter), or chlorine dioxide, or hydrogen sulfide (escape only), or formaldehyde, or hydrogen fluoride gases. Not for urethane or other diisocyanate-containing paints. ^{2,3,4}	492790	10	TC-23C-1582
GME-H	OV/AG/ AM/MA/ HF/FORM/ PEST/ PAINT/ HEPA		Approved for organic vapors, chlorine, hydrogen chloride, sulfur dioxide, ammonia, methylamine, pesticides, paint, lacquer and enamel mists, or chlorine dioxide, or hydrogen sulfide (escape only), or formaldehyde, or hydrogen fluoride; dusts, fumes and mists having a TWA less than 0.05 mg/m ³ ; asbestos, and radionuclides. Not for urethane or diisocyanate-containing paints. ^{2,3,5}	491630	6	TC-23C-1583

APPENDIX H
HEPA VACUUM

PULLMAN WHITE HOLT

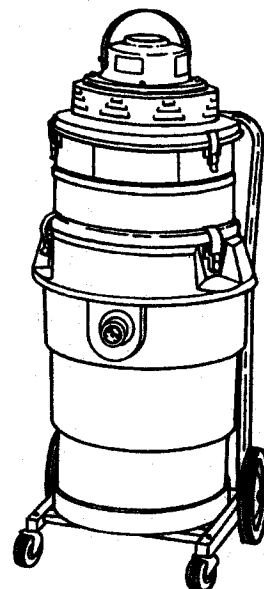
Operation & Care Instructions

Save For Future Reference

Model 102ASB-12P

Wet/Dry Asbestos Vacuum Cleaner

This vacuum cleaner is a high quality, precision made product. All parts used in the manufacturing of this vacuum cleaner have passed rigid quality control standards prior to assembly and an "each unit" final inspection prior to packaging is your assurance of proper assembly. This vacuum cleaner was protectively packed to prevent possible damage in transit. Should damage occur, please notify the transporting carrier immediately for loss and/or claim.



IMPORTANT SAFEGUARDS

MOTOR:

The suction head of this vacuum cleaner is equipped with a 2 stage, 12.5 amp, 2HP by-pass motor, developing 105" waterlift and 110 CFM.

When removing the motor head, care in handling is essential. Dropping, banging or other abuse may result in poor vacuum seal and a loss in suction power and will invalidate your warranty.

EXTENSION CORDS:

Vacuums that have 3 wire cords requiring grounding must only be used with extension cords that have 3-prong grounding type plug and 3-pole receptacles.

To determine the minimum wire size required, refer to the chart below:

Minimum Wire Size (AWG) of Extension Cord								
Nameplate Rating-Amps	Total Extension Cord Length (Feet)							
	25	50	75	100	125	150	175	200
0-10.0	18	18	16	16	14	14	12	12
10.1-13.0	16	16	14	14	14	12	12	12
13.1-15.0	12	12	12	12	12	12	12	-

Before using an extension cord, inspect it for loose or exposed wiring, damaged insulation and defective fitting.

CAUTION

Always disconnect power cable from outlet when working on this vacuum.

IMPORTANT SAFETY INSTRUCTIONS

When using an electrical appliance, basic precautions should always be followed, including the following:

READ ALL INSTRUCTIONS BEFORE USING THIS VACUUM CLEANER

WARNING

To reduce the risk of fire, electric shock or injury:

1. Do not leave appliance when plugged in. Unplug from outlet when not in use and before servicing.
2. Do not expose to rain. Store indoors.
3. Do not allow to be used as a toy. Close attention is necessary when used by or near children.
4. Use only as described in this manual. Use only manufacturer's recommended attachments.
5. Do not use with damaged cord or plug. If appliance is not working as it should, has been dropped, damaged, left outdoors, or dropped into water, contact the Pullman-Holt National Service Manager in Tampa, Florida at 1-800-237-7582.
6. Do not pull or carry by cord, use cord as a handle, close a door on cord, or pull cord around sharp edges or corners. Do not run appliance over cord. Keep cord away from heated surfaces.
7. Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
8. Do not handle plug or appliance with wet hands.
9. Do not put any object into openings. Do not use with any opening blocked; keep free of dust, lint, hair and anything that may reduce air flow.
10. Keep hair, loose clothing, fingers and all parts of the body away from openings and moving parts.
11. Do not pick up anything that is burning or smoking, such as cigarettes, matches, or hot ashes.
12. Do not use without dustbag and/or filters in place.
13. Turn off all controls before unplugging.
14. Use extra care when cleaning on stairs.
15. Do not use to pick up flammable or combustible liquids such as gasoline, or use in areas where they may be present.
16. This vacuum is for commercial use only.
17. Connect to a properly grounded outlet only. See grounding instructions.

SAVE THESE INSTRUCTIONS

IMPORTANTES MESURES DE SÉCURITÉ

L'utilisation d'un appareil électrique demande certaines précautions:

LIRE TOUTES LES INSTRUCTIONS AVANT DE FAIRE FONCTIONNER CET APPAREIL

AVERTISSEMENT:

Pour réduire les risques d'incendie, de choc électrique ou de blessure:

1. Ne pas laisser l'appareil sans surveillance lorsqu'il est branché. Débrancher lorsque l'appareil n'est pas utilisé et avant l'entretien.
2. Ne brancher qu'à une prise de courant avec mise à la terre. Voir les instructions visant la mise à la terre.
3. Ne pas permettre aux enfants de jouer avec l'appareil. Une attention particulière est nécessaire lorsque l'appareil est utilisé par des enfants ou à proximité de ces derniers.
4. N'utiliser que conformément à cette notice avec les accessoires recommandés par le fabricant.
5. Ne pas utiliser si le cordon ou la fiche est endommagé. Retourner l'appareil à un atelier de réparation s'il ne fonctionne pas bien, s'il est tombé ou s'il a été endommagé, oublié à l'extérieur ou immergé.
6. Ne pas tirer, soulever ou traîner l'appareil par le cordon. Ne pas utiliser le cordon comme une poignée, le coincer dans l'embrasure d'une porte ou l'appuyer contre des arêtes vives ou des coins. Ne pas faire rouler l'appareil sur le cordon. Garder le cordon à l'écart des surfaces chaudes.
7. Ne pas débrancher en tirant sur le cordon. Tirer plutôt la fiche.
8. Ne pas toucher la fiche ou l'appareil lorsque vos mains sont humides.
9. N'insérer aucun objet dans les ouvertures. Ne pas utiliser l'appareil lorsqu'une ouverture est bloquée. S'assurer que de la poussière, de la peluche, des cheveux ou d'autres matières ne réduisent pas le débit d'air.
10. Maintenir les cheveux, les vêtements amples, les doigts et toutes les parties du corps à l'écart des ouvertures et des pièces mobiles.
11. Ne pas aspirer de matières en combustion ou qui dégagent de la fumée, comme des cigarettes, des allumettes ou des cendres chaudes.
12. Ne pas utiliser l'appareil si le sac à poussière ou le filtre n'est pas en place.
13. Mettre toutes les commandes à la position ARRÊT avant de débrancher l'appareil.
14. User de prudence lors du nettoyage des escaliers.
15. Ne pas aspirer des liquides inflammables ou combustibles, comme de l'essence, et ne pas faire fonctionner dans des endroits où peuvent se trouver de tels liquides.
16. Avertissement—Pour réduire les risques de choc électrique, ne pas exposer à la pluie et garder l'aspirateur à l'intérieur.
17. Appareils mis à la terre: "Ne brancher qu'à une prise de courant avec mise à la terre. Voir les instructions visant la mise à la terre."

CONSERVER CES INSTRUCTIONS

GROUNDING INSTRUCTIONS

This appliance must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This appliance is equipped with a cord having equipment grounding conductor and grounding plug. The plug must be inserted into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING

Improper connection of the equipment grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service person if you are in doubt as to whether the outlet is properly grounded.

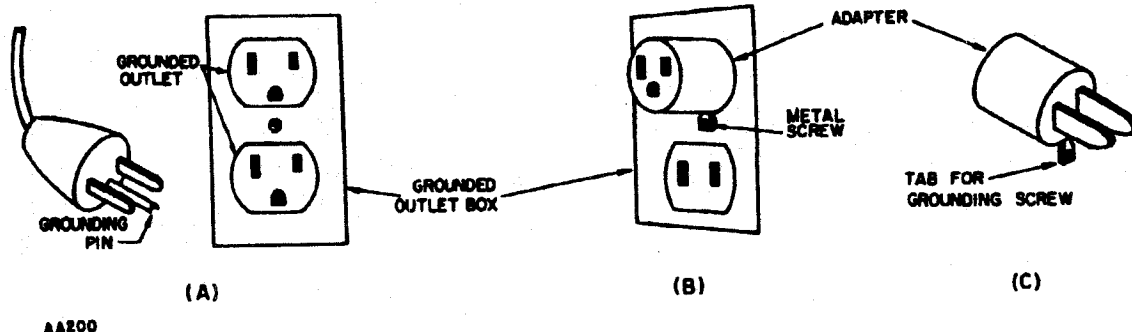
Do not modify the plug provided with the appliance – if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

INSTRUCTIONS VISANT LA MISE À LA TERRE

Cet appareil doit être mis à la terre. En cas de défaillance ou de panne éventuelles, la mise à la terre fournit au courant un chemin de moindre résistance qui réduit le risque de choc électrique. Cet appareil est pourvu d'un cordon muni d'un conducteur de terre et d'une fiche avec broche de terre. La fiche doit être branchée dans une prise appropriée correctement installée et mise à la terre conformément aux règlements et ordonnances municipaux.

AVERTISSEMENT

Un conducteur de terre mal raccordé peut entraîner un risque de choc électrique. Consulter un électricien ou un technicien d'entretien qualifié si vous n'êtes pas certain que la prise est correctement mise à la terre. Ne pas modifier la fiche fournie avec l'appareil - si elle ne peut être insérée dans la prise, faire installer une prise adéquate par un électricien qualifié.



AA200

This appliance is for use on a nominal 120-Volt circuit, and has a grounded plug that looks like the plug illustrated in sketch A below. A temporary adapter that looks like the adapter illustrated in sketches B and C may be used to connect this plug to a 2-pole receptacle as shown in sketch B if a properly grounded receptacle is not available. The temporary adapter should be used only until a properly grounded outlet (sketch A) can be installed by a qualified electrician. The green colored ear, lug, or the like extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box cover. Whenever the adapter is used, it must be held in place by a metal screw.

NOTE: In Canada, the use of a temporary adapter is not permitted by the Canadian Electrical Code.

Cet appareil est destiné à un circuit de 120 V et est muni d'une fiche de mise à la terre semblable à celle illustrée par le croquis A de la figure. S'assurer que l'appareil est branché à une prise de courant ayant la même configuration que la fiche. Aucun adaptateur ne devrait être utilisé avec cet appareil.

La mise à la terre selon les croquis B et C n'est pas permise au Canada.

ABOUT THE MACHINE

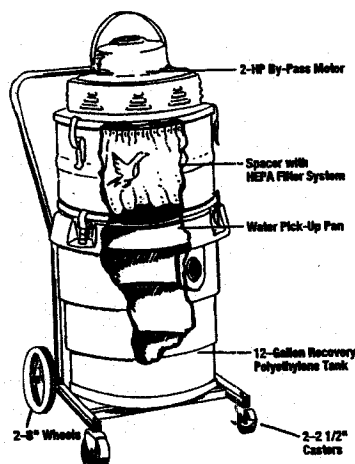
VACUUM ASSEMBLY GUIDE:

1. Remove and carefully set aside motor head and HEPA filter.
2. Position 8" rear wheels and insert 3/8" x 3 1/4" mounting bolts through the wheel and frame. Secure with 3/8" lock nuts.
3. Insert and push casters into the holes located at the front of the vacmobile metal frame.
4. Lock the casters in place with the hub nuts, using a rubber hammer.
5. Replace motor head and filter.

CAUTION

Always disconnect power cable from outlet when working on this vacuum.

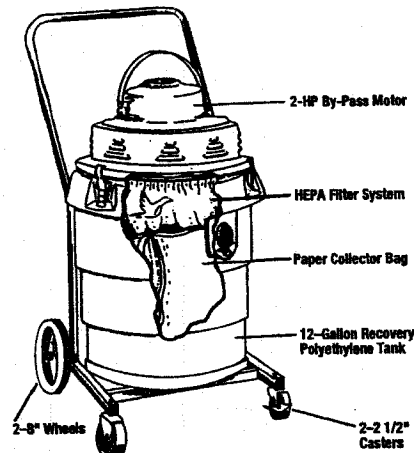
FOR WET OPERATION:



With HEPA filter and water pick-up pan in place, securely clamp motor head to the spacer. When the maximum water level in the vacuum cleaner polytank is reached the water pick-up pan's safety valve (float) closes off suction, automatically preventing further liquid intake.

NOTE: This will cause the motor to race. Turn off motor, remove and empty poly tank. Thoroughly clean float assembly. Replace water pick-up adapter, HEPA filter and motor head, then clamp securely. The vacuum cleaner is ready for wet use.

FOR DRY OPERATION:



With the HEPA Filter Assembly in place, the motor head securely clamped, and the metal hose adapter connected to the inlet, plug the power cable into the proper outlet. Select the appropriate hose wand and/or tool and connect to the hose adapter. The vacuum cleaner is ready for dry use.

DISPOSABLE BAG CHANGING:

Over filling the bag will result in loss of vacuum efficiency. The recommended bag replacement procedure is as follows:

1. Remove vacuum head and HEPA filter.
2. Tape a 6-mil poly bag over the canister so that the canister is completely enclosed.
3. Using the poly bag as a glove, disengage the paper bag from vacuum inlet stem inside the canister.
4. Invert the canister so that the paper bag falls into the poly bag. Seal the poly bag and dispose as prescribed by law.
5. Attach a new paper bag to the vacuum inlet securely and fold top of the bag down so it does not interfere with the HEPA filter.
6. Replace the HEPA filter and motor head.
7. Thoroughly vacuum the work area to recover any asbestos which may have been dropped.

CAUTION

When removing the motor head, care in handling is essential. Dropping or other abuse may result in poor vacuum seal and a loss of suction power, and will invalidate your warranty.

LIMITED WARRANTY

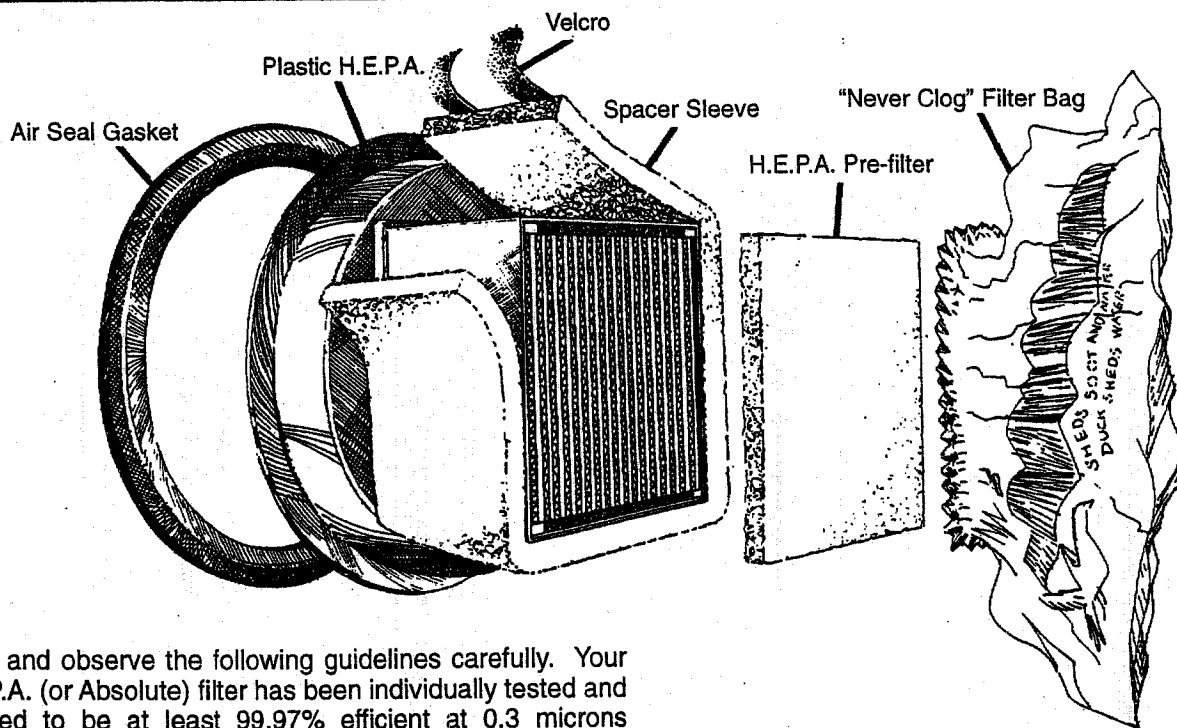
The vacuum motor is warranted for 2 years and other parts except filters for 90 days from the date of purchase as shown on your distributor's invoice. The warranty covers only failure due to defective parts or workmanship and will be invalidated by improper application and abusive damage.

In **NO** circumstance should you return a failed unit to the factory service center.

If you experience any problems with your vacuum during warranty period, contact the Pullman-Holt National Service Manager in Tampa, FL at (800)237-7582.

OPERATION AND CARE INSTRUCTIONS

H.E.P.A. FILTER SYSTEM



Read and observe the following guidelines carefully. Your H.E.P.A. (or Absolute) filter has been individually tested and certified to be at least 99.97% efficient at 0.3 microns (D.O.P. method). Proper application and care is required to prevent damage and insure maximum efficiency and longer filter life.

NOTE: Using replacement H.E.P.A. filters other than factory replacement filters supplied by Pullman-Holt will nullify all warranties, specific or implied. Filter components which have lost efficiency due to physical damage or clogging are not covered by warranty.

Air Seal Gasket:

If the air seal gasket is cut or otherwise damaged, resulting in air leakage, simply remove it from the filter flange and replace with a new gasket.

H.E.P.A. Filter:

This is the final filtration stage. The filter media (white filter paper) is fragile and easily damaged. Care is therefore necessary during handling and use to prevent damage. A H.E.P.A. filter which shows evidence of physical damage to the white media or corrugated separators will no longer perform at the originally certified efficiency and should not be used.

No maintenance is required other than frequent changing of the prefilters. A clogged H.E.P.A. filter cannot be cleaned. It must be replaced.

IMPORTANT: H.E.P.A. filter replacement is indicated by checking the top surface of the filter media for discoloration. A good filter will be chalk white. Under normal operating conditions and with proper care, a H.E.P.A. filter should have a useful life of several hundred hours.

Polyester Prefilter:

A polyester prefilter about one inch (1") thick is attached to the inlet (bottom) surface of each H.E.P.A. filter with Velcro strips. Its function is to provide final protection to the H.E.P.A. filter from premature failure due to clogging. Frequent changing of this filter will prolong H.E.P.A. life. Be sure the replacement prefilter completely covers the H.E.P.A. filter inlet.

Dacron "Never Clog"

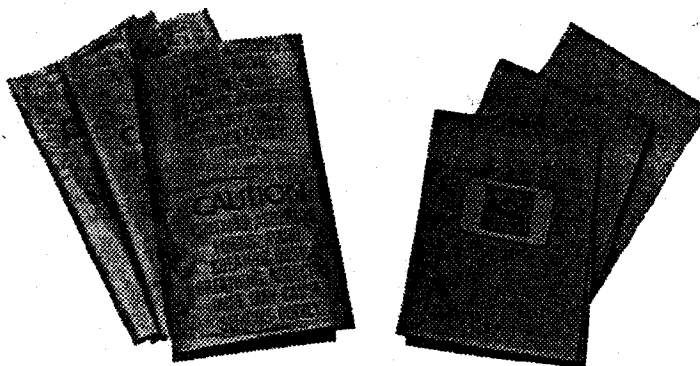
Filter Bag: H.E.P.A. filter equipped vacuums are supplied with a white "Never Clog" filter bag surrounding the H.E.P.A. filter barrel. A one inch (1") thick spacer sleeve is also supplied with these vacuums and is secured to the H.E.P.A. filter barrel with two Velcro strips. The purpose of the sleeve is to space the dacron bag away from the H.E.P.A. filter barrel to utilize the full area of the dacron bag. **NEVER USE THE DACRON BAG WITHOUT A SPACER SLEEVE.** This will result in clogging of the small area of the dacron bag contacting the bottom of the H.E.P.A. filter, rapid loss of vacuum efficiency, and possible rupture of the H.E.P.A. filter. The dacron filter bag should be changed frequently and can be washed in laundry detergent and warm water.

WARNING: A used filter is contaminated and must be disposed of in accordance with local and federal E.P.A. regulations.

Disposable Paper Collector Bag for Dry Pick-up:

This is the primary (or first) filter in a dry pick-up system. It is assembled to the vacuum inlet inside the can by grasping the cardboard tabs on the bag and pushing the rubber closure all the way over the inlet until the bag is in contact with the inside can surface. **DO NOT OVERFILL.** The need for a bag change is usually indicated by a reduction in vacuum performance. Replacement paper bags are available from your distributor.

IMPORTANT: A properly labeled 6 mil. Poly bag must be used to contain the full paper bag for disposal in accordance with local and federal E.P.A. regulations. Do not attempt to use a poly bag inside the vacuum can.



WARNING:

All persons engaged in, or in the immediate vicinity of asbestos removal operations are required to observe all applicable sections of O.S.H.A. regulation 1910-1001, as amended in the Federal Register. Also observe all applicable state and federal E.P.A. regulations.

Use extreme caution when removing vacuum equipment from the work site for transportation and/or storage. Surfaces of the pick-up tools, wand, hose, and canister may remain contaminated with fine asbestos particles. It is **RECOMMENDED** that used equipment be enclosed in

a sealed poly bag prior to removal from the work site. Thorough washing with water will reduce the amount of dust retained on the equipment. Be sure the tools, wands, etc., are thoroughly dried before storage. Dispose of contaminated water properly.

All dry pick-up operations of fine, dry powder (such as asbestos) require the use of a disposable paper bag attached to the can inlet inside the can to provide primary filtration. **DO NOT ATTEMPT DRY POWDER PICK-UP WITHOUT A PAPER BAG.**

APPENDIX I
ENCAPSULANT MSDS

MATERIAL SAFETY DATA SHEET

REVISION DATE: 03-16-2001

SUPERSEDES: 09-14-2000

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

COMPANY INFORMATION

Foster Products Corporation
H.B. Fuller Company Subsidiary
2900 Granada Lane
Oakdale, MN 55128
Phone: 651-236-3785

Medical Emergency Phone Number (24 Hours): 1-888-853-1758
Transport Emergency Phone Number (CHEMTREC): 1-800-424-9300

PRODUCT INFORMATION

PRODUCT IDENTIFIER: CP2100
PRODUCT NUMBER: CP2100
PRODUCT NAME: CHILDERS CP-210
TRADEMARK: CHIL-ABATE™
PRODUCT DESCRIPTION: Encapsulant

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Unlisted ingredients are not 'hazardous' per the Occupational Safety and Health Administration Hazard Communication Standard (29 CFR 1910.1200) and/or are not found on the Canadian Workplace Hazardous Materials Information System ingredient disclosure list. See Section 8 for any additional exposure limit guidelines.

Chemical Name	CAS #	PERCENT	OSHA PEL
Sodium silicate	1344-09-8	10 - 30	Not established
Ethylene glycol	107-21-1	1 - 5	Ceiling 125 MG/M3

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Corrosive to eye tissue.
Causes severe skin irritation.
Severe respiratory tract irritant.
Harmful if swallowed.

HMIS RATING: HEALTH -- 3 FLAMMABILITY -- 0 REACTIVITY -- 0

See SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for personal protective equipment recommendations.

POTENTIAL HEALTH EFFECTS BY ROUTE OF ENTRY

EYE: Corrosive to eye tissue. Can cause severe irritation, tearing, and burns that can quickly lead to permanent injury including blindness.

SKIN: Contact causes severe skin irritation and possible burns.

MATERIAL SAFETY DATA SHEET

INHALATION: Can cause severe respiratory irritation, nausea, and headache.

INGESTION: Ingestion is not an anticipated route of exposure. Harmful if swallowed. Corrosive to tissue. Can cause severe and permanent damage to mouth, throat, stomach. Aspiration may lead to lung damage.

LONG-TERM (CHRONIC) HEALTH EFFECTS

TARGET ORGAN(S): Central nervous system, Kidneys, Liver

REGULATED CARCINOGEN STATUS:

Unless noted below, this product does not contain regulated levels of NTP, IARC, ACGIH, or OSHA listed carcinogens.

EXISTING HEALTH CONDITIONS AFFECTED BY EXPOSURE: Kidney disease; Liver disease

SECTION 4: FIRST AID MEASURES

IF IN EYES: Immediately flush eyes with plenty of water for at least 20 minutes retracting eyelids often. This corrosive material can cause immediate and permanent eye damage. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention and monitor the eye daily as advised by your physician.

IF ON SKIN: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

IF VAPORS INHALED: Remove to fresh air. Restore breathing, if necessary. Keep warm and quiet. Call a physician.

IF SWALLOWED: Corrosive. Do not induce vomiting! Drink one glass of water followed by milk if available. Seek medical attention immediately. Do not give anything by mouth to an unconscious person. Induce vomiting as a last measure. Induced vomiting may lead to aspiration of the material into the lungs potentially causing chemical pneumonitis that may be fatal.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT:

Non flammable

AUTOIGNITION TEMPERATURE:

Not established

LOWER EXPLOSIVE LIMIT (% in air):

Not established

UPPER EXPLOSIVE LIMIT (% in air):

Not established

EXTINGUISHING MEDIA:

Use water spray, foam, dry chemical or carbon dioxide.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

There is a possibility of pressure buildup in closed containers when heated. Water spray may be used to cool the containers.

SPECIAL FIRE FIGHTING INSTRUCTIONS:

Persons exposed to products of combustion should wear self-contained breathing apparatus and full protective equipment.

HAZARDOUS COMBUSTION PRODUCTS:

Carbon dioxide, Carbon monoxide

SECTION 6: ACCIDENTAL RELEASE MEASURES

SPECIAL PROTECTION: Exposure to the spilled material may be severely irritating or toxic. Follow personal protective equipment recommendations found in Section 8 of this MSDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, and the area

MATERIAL SAFETY DATA SHEET

CLEAN-UP:

in which the spill occurred. Never exceed any occupational exposure limits. Dike if necessary, contain spill with inert absorbent and transfer to containers for disposal. Keep spilled product out of sewers, watersheds, or water systems.

Contain spill, dilute if necessary and neutralize. Remove with inert absorbent.

Transport Emergency Phone Number (CHEMTREC): 1-800-424-9300

SECTION 7: HANDLING AND STORAGE

Handling: Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Aluminum is not an acceptable material of construction for pumps, mixers, fittings or storage for this product.

Storage: Store in a cool, dry place.

Consult the Technical Data Sheet for specific storage instructions.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EYE PROTECTION:

Wear chemical splash goggles when handling this product. Additionally, wear a face shield when the possibility of splashing of liquid exists. Do not wear contact lenses. Have an eye wash station available.

SKIN PROTECTION:

Prevent contact with this product. Wear chemically resistant gloves, long sleeved shirt, an apron, and other protective equipment depending on conditions of use.

GLOVES:

Butyl rubber

RESPIRATORY PROTECTION:

Respiratory protection will be required when ventilation or other engineering controls can not reduce the exposure to acceptable levels. NIOSH approved air purifying respirator with dust/mist filter if product is sprayed.

Respirators should be selected by and used following requirements found in OSHA's respirator standard (29 CFR 1910.134).

VENTILATION:

Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

EXPOSURE LIMITS:

Chemical Name	ACGIH EXPOSURE LIMITS	AIHA WEEL
Sodium silicate	Not established	Not established
Ethylene glycol	Ceiling Aerosol 100 MG/M3	Not established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:

Liquid

MATERIAL SAFETY DATA SHEET

COLOR: Clear
ODOR: Neutral
ODOR THRESHOLD: Not established
WEIGHT PER GALLON (lbs.): 9.00
SPECIFIC GRAVITY: 1.07
SOLIDS (% by weight): 13.0

pH: 11.0
BOILING POINT (deg. C): Not established
FREEZING/MELTING POINT (deg. C): Not established
VAPOR PRESSURE (mm Hg): Not established
VAPOR DENSITY: Not established
EVAPORATION RATE: Not established
OCTANOL/WATER COEFFICIENT: Not established

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Stable under normal conditions.
CHEMICAL INCOMPATIBILITY: Aluminum alloys
HAZARDOUS POLYMERIZATION: Will not occur.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide

SECTION 11: TOXICOLOGICAL INFORMATION

CHEMICAL NAME	LD50/LC50
Sodium silicate	Oral LD50 Rat = 1.1 g/kg
Ethylene glycol	Oral LD50 Rat = 4700 mg/kg Inhalation LC50 Rat = 10876 mg/kg Dermal LD50 Rabbit = 9.53 ml/kg

TOXICOLOGY SUMMARY: No additional health information available.

SECTION 12: ECOLOGICAL INFORMATION

OVERVIEW: No ecological information available

SECTION 13: DISPOSAL CONSIDERATIONS

This product meets the definition of hazardous waste under the U.S. EPA Hazardous Waste Regulations 40 CFR 261. It is corrosive waste class D002. We recommend the required corrosivity testing on product to determine the appropriate waste category. Disposal via incineration is recommended. Consult your state, local, or provincial authorities for more restrictive requirements.

SECTION 14: TRANSPORTATION INFORMATION

Consult Bill of Lading for transportation information.

SECTION 15: REGULATORY INFORMATION

INVENTORY STATUS

U.S. EPA TSCA: This product is in compliance with the Toxic Substances Control Act's Inventory requirements.

If you need more information about the inventory status of this product call 651-236-5858.

MATERIAL SAFETY DATA SHEET

TSCA Section 12(b) - Export Notice Requirements

This product contains a chemical substance that is currently on the EPA's Section 12(b) Export List. Contact the company Global Regulatory Group at 651/236-5858 for the identity of the Section 12(b) chemical(s).

FEDERAL REPORTING

EPA SARA Title III Section 313

Unless listed below, this product does not contain toxic chemical(s) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR part 72. EPA has advised that when a percentage range is listed the midpoint may be used to fulfill reporting obligations.

Chemical Name	CAS#	%
Ethylene glycol	107-21-1	1 - 5

WHMIS STATUS: Unless listed below, this product is not controlled under the Canadian Workplace Hazardous Materials Information System.

D2B D2A
E

STATE REPORTING

This MSDS is not prepared for distribution in California.

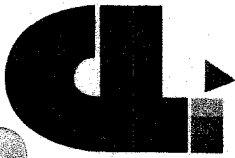
SECTION 16: ADDITIONAL INFORMATION

This Material Safety Data Sheet is prepared to comply with the United States Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Workplace Hazardous Materials Information System (WHMIS).

Prepared by: The Global Regulatory Department
Phone: 651-236-5842

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APPENDIX J
CHOPRA - LEE MONITORING PLAN



CHOPRA-LEE



1815 Love Road
Grand Island, NY 14072
716-773-7625 PHONE
716-773-7624 FAX

December 19, 2003

Mr. Mike Lynch
Frontier Insulation
2101 Kenmore Avenue
Buffalo, New York 14207

RE: Asbestos Sampling at the Niagara Falls Storage Site,
Lewiston, NY

Dear Mr. Lynch:

The amount of material to be removed in each work area will determine the size of the project, (minor, small & large). A brief description of the asbestos air sampling for this project and what determine the size of the project are listed below.

Asbestos Air Samples:

Background Samples: The sampling method of determining airborne asbestos fiber concentrations inside and outside of the work area prior to starting an asbestos project.

Prep Samples & Pre-cleaning Samples: The sampling method of determining if the contractors are disturbing any asbestos during preparation for abatement.

Environmental or Work in Progress Samples: The sampling method of determining if during abatement, that airborne asbestos fiber are being released from the work area.

Final Clearance Samples: The sampling method to determine the airborne concentration of fibers upon conclusion of an asbestos abatement project.

Size of Asbestos Project & Air Sampling for this project:

Minor Asbestos Project: 10 square feet or less or 25 linear feet or less of asbestos material.

Background Samples: 1 inside the work area and 1 outside the work area.

Prep Samples: 1 inside the work area and 1 outside the work area.

Environmental Samples: 1 inside the work area, 1 outside the work area at the airlock, 1 sample at the negative air exhaust and 1 sample in the clean room.

Final Clearance Samples: 1 inside the work area and 1 outside the work area.



CHOPRA-LEE
INCORPORATED

Mr. Lynch
Frontier Insulation
December 19, 2003

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Small Asbestos Project: more than 10 and less than 160 square feet or more than 25 and less than 260 linear feet of asbestos material.

Background Samples: 3 inside the work area and 3 outside the work area.

Prep Samples: 3 inside the work area and 3 outside the work area.

Environmental Samples: 1 inside the work area, 1 outside the work area at the airlock, 1 sample at the negative air exhaust and 1 sample in the clean room.

Final Clearance Samples: 3 inside the work area and 3 outside the work area.

Large Asbestos Project: 160 square feet or more or 260 linear feet or more of asbestos material.

Background Samples: 5 inside the work area and 5 outside the work area.

Prep Samples: 5 inside the work area and 5 outside the work area.

Environmental Samples: 1 inside the work area samples, 2 Barrier samples, 1 Ambient air sample, 1 sample in the clean room of the decon, 1 sample at the waste-out, 1 sample at the waste container and 1 sample for every exhaust hose of the negative air machines.

Final Clearance Samples: 5 inside the work area and 5 outside the work area.

The locations for the asbestos air sampling to be performed at the Niagara Falls Storage Site are as follows.

Background Samples: 5 inside of the work area, 5 outside the work area.

Prep Samples: 5 inside of the work area, 5 outside the work area.

Environmental Samples or Work in Progress Samples: 1 inside the work area samples, 2 critical barrier samples, 1 Ambient air sample, 1 sample in the clean room of the decon, 1 sample at the waste-out, 1 sample at the waste container and 1 sample for every exhaust hose of the negative air machines.

Final Clearance Samples: 5 inside of the work area, 5 outside the work area in the same locations as the Background samples.

A drawing of the work area with the sample locations will be provided to Frontier Isulation.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

Scott Hammond
Project Manager

1 Introduction

This manual is to be used by the Chopra-Lee Air Sampling/Asbestos Safety Technician as both a procedural guideline for performing air sampling and as a standard to be referenced when needed. It is also intended as an informative and essential tool for learning the air sampling procedures and corresponding paper work. The technician shall always have this manual on site.

The Chopra-Lee air sampling procedure, in general, follows the methods of New York States Industrial Code Rule 56, subpart 56-17 (air sampling, monitoring and analysis). A knowledge of its rules and regulations will be of great value and will help the Chopra-Lee technician to communicate with the foreman and workers at the work area. A thorough understanding of Rule 56 will allow an educated assessment of the job site and its effects on air sampling procedures. In addition to always having this manual at a work site, the Chopra-Lee technician will need the equipment and supplies listed in Appendix A.

The technician will be shown the correct care and maintenance of all equipment as well as its proper handling for use at the work site. Remember, care and maintenance of all equipment is essential for your protection and safety as well as that of all other workers at the job site.

In summary, it is the intent of Chopra-Lee to standardize all field operations and paper work pertaining to air sampling.

2 Arrival, Set Up and Collection

On any asbestos work site the contractor requires the technician to sign in, **this shall be done before anything else**. After getting acquainted with all project personnel, the Chopra-Lee technician should become familiar with the work site. Prompt arrival on-site with the proper equipment is vital; it saves time, energy and money. If possible, get confirmation on the project size, power availability, and estimated length of project before arriving. For a large project always arrive on site with a minimum of five (5) pumps, for a small or minor project always arrive with a minimum of three (3) pumps. A technician must learn where to tap into the contractors power source and how many extension cords and splitters will be needed to cover the required area.

It is of the utmost importance that the greatest care be taken in the labeling, setting up, handling, and monitoring of the cassettes. Samples shall be labeled with the proper identification number (as described in the Paper work section) before sample collection begins. Sampling pumps shall be calibrated at the start of sample collection. The technician must note that a flow meter will often have a correction scale. This scale, labeled opposite the factory scale on the flow meter, shall be utilized when making a reading. The flow reading shall always be read to the nearest one half of a liter, making sure that the flow meter is held vertically and at eye level. The flow meter reading is taken at the center of the ball. The technician is responsible to check the calibration of the flow meter before each project and at least once a month.

The labeled sample cassette shall be attached to the hose inlet at approximately breathing level (5-6 feet high). The cassette should be angled at approximately 45 degrees to the horizontal. A visual inspection should be made for leaks and loose connections and the interior of each cassette should be checked to ensure that the filter paper is properly placed.

After the samples are set up, they should be rechecked every 30-60 minutes. Improperly attached samples, power loss, and human tampering will contribute to a loss of sample integrity. In the event of a loss of sample integrity, it is extremely important that the cassette **not** be reused. Instead, it should be properly disposed of and a **new** cassette with a **new** sample number set up in its place.

The technician should always keep in mind that the pumps and other equipment should never be left unattended in any area where there may be potential for damage or theft.

3 Standard Sampling Schemes

3.1 PCM Sampling

Most asbestos air monitoring samples which the technician collects will be analyzed by Phase Contrast Microscopy (using the NIOSH method 7400). This is where the term PCM sampling was derived. The filters to be used are 0.8 μ m MCE's.

At least two "blank" samples shall be collected for each set of samples collected in a day. The number of blanks shall equal to 10% of the number of actual samples run or at least two, which ever is greater. Blank PCM samples are collected by opening the cassette for not more than 30 seconds and resealing. Blanks are assigned a sample number as if it were any other sample.

- | | |
|----------------|---|
| Large Projects | - Backgrounds 5 inside work area, 5 outside work area
- Environmentals 5 outside work area
- Finals 5 inside work area, 5 outside work area |
| Small Projects | - Backgrounds 3 inside work area, 3 outside work area
- Environmentals at client request
- Finals 3 inside work area, 3 outside work area |
| Minor Projects | - These do not require air monitoring by the law therefore the client often requests what should be done and either we advise or the client dictates the sampling scheme. |

3.2 TEM Sampling Guidelines

The following guidelines are abridged from the EPA's 40 CFR 763 (AHERA) and are to be applied to any primary or secondary school project that requires final air clearance. Please refer to the AHERA guidelines for specific detail. If the project has greater than 100 sq ft or 260 linear ft, then AHERA TEM sampling scheme is applicable. TEM cassettes are to be either 0.45 μ m Mixed Cellulose Ester (MCE) or 0.4 μ m Polycarbonate (PC) filter.

In accordance with the New York State Education Department, if an asbestos abatement project is greater than or equal to 3 sq or 3 linear ft in a school, then TEM clearance monitoring must be done. The number and location of the samples is not specified, Chopra-Lee, Inc. advises that the AHERA sampling scheme of 5 samples inside the work area, 5 samples outside work area and the appropriate 3 blanks be collected. In situations where this arises the technician must consult with the field manager and the school personnel as to the number of samples to be taken.

Often TEM sampling is requested in settings other than schools, when this comes up contact the field manager as to how many samples, where and the appropriate protocols for sample collection.

AHERA	-5 samples inside work area
TEM Clearance	-5 samples outside work area
	-3 blanks (1 inside work area, 1 outside work area, 1 sealed blank)

3.3 Personal Sampling Guidelines

Often we are requested by contractors to perform their OSHA sampling. When this occurs the technician will first get approval from his/her supervisor and then obtain a separate job number and handle the personnel sampling as a separate job. Personnel sampling involves taking Permissible Exposure Limit (PEL) samples, usually for a duration of 4 to 8 hours, and Short Term Exposure Limit (STEL) samples for a duration of 30 minutes. The technician should stay on-site during the time of sampling unless otherwise directed by his/her supervisor.

The contractor is required to sample 25% of his workers for each given day. The contractor will dictate on whom and how many sample will be taken each day. Personal air samples and pumps are handled somewhat differently than the stationary air pumps. The fully charged, calibrated, and running pump should be mounted on the worker at waist level with the tubing running up the back and over the workers shoulder to the cassette which is taped on the lapel. The worker wears the pump inside the work area while he works and must clean off the pump before returning it to the technician. When the pump is returned the technician will calibrate and turn off. If the personal pump is received from the worker at the end of the sampling period and it is no longer running the technician will ask the worker at what time the pump was stopped and this will be recorded as the stop time. If the worker does not know when the pump stopped the technician **will not** mark down a stop time and a volume will not be calculated. The sample will be analyzed and the results reported in fibers per millimeter squared.

Occasionally the contractor will ask us to do their personal monitoring even though they are not our clients on the particular project. The technician should contact his/her supervisor for approval. Chopra-Lee wishes to avoid a conflict of interest.

Personnel	-Short Term Exposure Limit samples (30 minutes)
	-Permissible Exposure Limit samples (4-8 hours)

3.4 Flow Rates and Volumes

It is important that the technician exercise good judgment in setting pump rates. Very often, the longer the sample collection, the more representative will that sample be of the air around the work area. Since this will depend on the equipment available, the number of samples to be collected, and the time allotted for the air sampling, the technician should exercise due care in budgeting his time.

The table of rates and volumes located below was designed to comply with the applicable regulations and methods while still allowing the technician flexibility when sampling.

The following chart outlines sample flow rates and volumes mandated by Chopra-Lee.

Type of Sample	Sample Collection Rate (LPM)	Sample Volume (Liters)	Filter Type
PCM	2-15	Min 1200-1600	0.45um MCE 0.8um MCE
TEM	*2-10	*Min 1200-1600	0.45um MCE 0.4um PC
Personal TWA	*0.5-2.5	400+	0.8um MCE
STEL	*0.5-2.5	60-120 (30 Min)	0.8um MCE

*Denotes rates or volumes mandated by law

It should be kept in mind that when finals are collected the pumps should be run at or near their maximum allowable rate.

Though these guidelines will often be followed, project specifications must always first be checked for job specific flow rates and volumes. For this reason, it is important that the technician acquire any specifications from the contractor before starting sampling.

4 General Policies

Chopra-Lee, Inc will provide the necessary equipment, safety and training for each sample technician. Each sample technician will have a minimum of a New York State Handlers Licence, respirator fit test semi-annually and a medical examination once a year. Often it is required by our contracts that the technicians on their job sites receive a substance abuse test.

Upon the commencement of an air sampling project, make it a point to get acquainted with all the persons who are directly involved with the current project. A friendly, but *professional* approach often sets the grounds for a good relationship with the client and other contractors.

The technician shall be held responsible for all equipment he has signed out of the Chopra-Lee office. For this reason it should be handled carefully and clear records should be kept of its whereabouts. At the end of a sampling period, a check shall be made to see that all equipment is accounted for. At the completion of a project it is the technicians responsibility to clean the pumps before letting them go to another job site. Equipment shall not be loaned out to individuals outside of Chopra-Lee without prior permission of a supervisor.

The technician shall keep clear and careful records of all time spent on the job, including delays, travel time, etc... It is mandatory that the technician be able to fully account for his time during a sampling period.

It has already been noted that a Chopra-Lee technician should conduct himself in a friendly yet professional manner. For this reason, it is important that, with the exception of meals, the technician stays on site and remains visibly occupied and accessible to other workers and supervisors.

It is our policy to assist the client / contractor whenever possible. If one has to be on the project site for hours at a time without anything to do, ask the contractor if there is any thing you can help with. Always be cognizant of unions while on-site, offers of help may be responded negatively.

The technician should arrive on the project site wearing clothing appropriate to the job he/she will be performing. (ie. no shorts, jams, rude t-shirts, muscle shirts). Often in industrial settings long sleeve shirts are required, it is advantageous for the technician to keep one with him while working

5 Safety

Technicians are required to follow all designated safety standards involving decontamination procedures, the use of proper respiratory equipment, etc... These regulations are detailed in such sources as Rule 56. It is stressed that adherence to appropriate safety standards is mandatory and of the highest priority. If any questions arise, the technician should refer to his/her copy of the safety manual or contact a supervisor immediately. **At no time should the technician risk personal safety to collect samples.** For example, if an electrical storm occurs while pumps are running on a roof, the technician should allow the pumps to run rather than risk personal injury in taking them down. The pumps may be removed at a later time. The technician should always check that all equipment (ladders, electrical cords, etc..) is safe and in proper working order. In the unlikely event that injury does occur, a supervisor should be notified as soon as possible.

The equipment should always be placed so as to minimize risk and inconvenience to others. For instance, if it is necessary that electrical cords be laid on the floor, they should be located as safely as possible and secured with tape.

Often work takes place in industrial settings where safety requirements are very strict. When entering a plant situation the technician should ask the appropriate owner's representative if there are any standard safety procedures that one must be aware of. It is vital that Chopra-Lee employees always adhere to these safe work practices in industrial settings.

Each technician should refer to Chopra-Lee's Hazard Communication program for specific detail about chemicals and materials which they come in contact with.

6 Paperwork

The following is the summary of Chopra-Lee forms, what information goes on them, how they are to be filled out, and how many copies are made of each. See Appendix B for completed examples.

6.1 Forms

It is of extreme importance that all forms be filled out as neatly and accurately as possible. Errors should never be scribbled out, blocked out, whited out, etc... If an error is made, a single ink line shall be drawn through it. Also, black ball point pen shall be used for all paperwork. Pencils, markers, and colored ink are unacceptable.

Forms shall be filled out completely (leaving blank spaces is not an option). Chopra-Lee forms are as follows:

AIR SAMPLE WORKSHEET - *To be completed daily* - This form contains all of the important information for daily sampling. The first item which should be filled out is the heading, including weather conditions, date, filter lot number, calibrator number, job name and job number. Also the client data is to be completed such as client name, client project reference (eg: job number, field order #) and client contact with the phone # (this is very important so that they can be contacted with the results if need be). The client project references can be obtained by simply asking the foreman or supervisor on site. For each sample collected the field number, pump number, location - in the form of a letter (a letter is assigned to each individual location and these letters are referenced on the drawing) and a very brief description of the area is given. IB denotes inside of a building while OB denotes outside a building. OWA denotes outside the work area while IWA denotes inside the work area. The pump run time and flow must be recorded in order to calculate the volumes. Record the flow to the nearest 1/2 liter and the time to the nearest minute, make sure to complete all calculations, including volume.

DRAWING FORM - *To be completed / updated during the project* - On this form there are 5 items which must be drawn, if all 5 items are not indicated the sheet is incomplete.

1. The entire work site (use two maps if necessary) including adjacent buildings.
2. The asbestos involved in the project.
3. The location of the air samples.
4. The containment area.
5. The location of the decontamination units.

Though this drawing does not have to be exactly to scale, it should be **very neat** (ie: use a straight edge) and drawn with enough clarity so that when looked at, sample locations and asbestos location can be determined. Sample locations shall be designated on the drawings with individual letters. These letters shall correspond with location letters on the AIR SAMPLE WORKSHEET. The area of containment shall be outlined by a thick border. Often the original map for the project may not truly represent the area (may be to

crowded, a room may have been left out etc...)by the end of the project, this warrants drawing a new map. See example.

SAMPLE CASSETTE LABELS - *To be completed for each sample taken*- Each sample is to be labelled. Each label must include a minimum of the sample number. It is of the utmost important that the sample are labelled accurately and neatly.

SAMPLE WORKSHEET - *As needed* - This form is used to summarize samples not listed on the **AIR SAMPLE WORKSHEET**. These may be bulk samples which are given to the technician by the client on the job site or samples which they are requested to take themselves or any other type of sample which is received.

PERSONAL SAMPLING WORKSHEET - *To be filled out on a daily basis* - This form is used to record peronnel samples for the contractor. This contains the worker name, social security number, worker's activity during sampling, respirator protection worn by the worker, unique sample number, date/time of sampling, foreman on site, the sampler, pump number, and the appropriate flow rates, times and volume calculations. This form is to be used until all spaces are filled in and then the samples are to be brought for analysis unless otherwise directed by the contractor or supervisor. See example.

6.2 Sample Collection Data

Military shall always be used when recording time. This system is used to clearly distinguish between A.M. and P.M. times. It is easily learned by imagining a 24 hour clock starting at midnight. Some examples may clarify this

12:00 Midnight	=	00:00	Military Time
12:45 A.M.	=	00:45	" "
5:15 A.M.	=	05:15	" "
12:00 Noon	=	12:00	" "
1:00 P.M.	=	13:00	" "
11:45 P.M.	=	23:45	" "

The sample numbers incorporate the job #, date, running number, and the type of sample. For instance, a sample number with a format such as:

100-0105-17

- 100 would be the job number
- 0105 represents the date (January 5)
- 17 is the running sample

When adding a section number of the job number (ie: adding -6, -P, etc...) first verified that the number is not already in use. When such changes occur, they **will not** be reflected in the sample number in the form of a longer job number sections, such as:

Job Number	NY001100-6	
	Correct	<i>Incorrect</i>
Sample Number	100-0105-17	<i>100-6-0130-17</i>

6.3 Submittal of Paperwork

After having collected samples and made the appropriate calculations, but before leaving the site, the technician shall sign the chain of custody under "sampler". The Chopra-Lee technician will return to the office with the samples. The technician signs the "relinquished by" when the samples are submitted to the lab and it is signed by the receiving person in the "received by lab" area.

Note that many forms are a carbonless packet of two colored pages (yellow and white). With all these forms the technician shall retrieve the yellow page from the packet and place it into the project field notebook. The lab retains the remaining white page.

If the sampling technician turns over samples to another person to transport to the lab, the transport person must sign the "received by" and the "relinquished by" areas.

If the technician is on an out of town project and the samples are sent by courier he/she shall; enter courier information into the "received by" area, tear off the yellow page for the project folder, and send the white page to the lab.

Note: The paperwork must be turned in completed. Volume calculations, chain of custody, clear maps, address of work site, contact person and phone number, appropriate client signatures etc..., shall all be present. If for any reason there are errors, the paperwork will be returned to the technician and he/she will correct any errors.

Appendix A Equipment List

Assigned equipment:

Tool Box:

- Flow Meter
- Flash light
- Safety Glasses
- Straight Edge

Hard Hat

Respirator

Air Sampling Handbook:

- Air Sampling Manual
- EPA Rules and Regulations
- NY State Industrial Code Rule 56
- OSHA Rules and Regulations
- Asbestos Analysis Procedures

Form Pads

Sign Out (per job)

- Low Vol Pumps
- Hi-Vol Pumps
- Blowers and Fans
- Generator
- Extension cords and splitter
- Gas Can

Consumables (as needed)

- Respirator cartridges
- Ziplock bags
- Duct tape
- Tyvex suits
- Cassettes
- Extra Forms

Technician is Expected to have:

Watch

Rubber soled work boots

Hand Tools

Calculator

Appropriate Clothing

Dependable Automobile

Appendix B

Terminology

The following section contains words, abbreviations and acronyms which the air sample technician will likely need to know.

Definitions (Abridged from NYS Rule 56)

Abatement- Procedures to control fiber release from asbestos material. This includes removal, encapsulation, enclosure and repair.

Aggressive Sampling- A method of sampling in which the person collecting the air sampling creates activity by the use of mechanical equipment during the sampling period to stir up settling dust and simulate activity in the area of the building.

Air Sampling- The process of measuring the fiber content of a known volume of air collected during a specific period of time.

Area Air Sampling- Any form of air sampling or monitoring where the sampling device is placed at some stationary location.

Asbestos- Any naturally occurring hydrated mineral silicate separable into commercially usable fibers, including chrysotile (serpentine), amosite (cummingtonite-grunerite), crocidolite (reibeckite), tremolite, anthrophyllite and actinolite.

Asbestos Handler- An individual who installs, removes, applies encapsulates, or encloses asbestos or asbestos material or who disturbs friable asbestos.

Asbestos Handling Certificate- A certificate issued by the commissioner to a person who has satisfactorily completed an approved asbestos safety program.

Background Level Monitoring- A method used to determine airborne asbestos fiber concentrations inside and outside of a building or structure prior to starting an asbestos project.

Cleanup- The utilization of HEPA vacuuming and/or wet cleaning to control and eliminate accumulations of asbestos material and asbestos waste material.

Clearance Air Monitoring- The employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of residual fibers upon conclusion of an asbestos abatement project.

Decontamination Enclosure System- A series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of persons, materials, equipment and authorized visitors.

Encapsulation- The coating or spraying of asbestos material with a sealant.

Friable- That condition of crumbled, pulverized, powdered, crushed or exposed asbestos which is capable of being released into the air by hand pressure.

Glovebag Technique- A method for removing asbestos material from heating, ventilating, and air conditioning (HVAC) ducts, piping runs, valves, joints, elbows and other nonlinear surfaces in a work area not contained. The glovebag assembly is a manufactured device consisting of a glovebag constructed of at least six mil transparent plastic, two inward-protecting waterwand sleeve, an internal tool pouch, and an attached, labeled receptacle or portion for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and to contain all asbestos fibers released during the abatement process.

HEPA Filter- A high efficiency particulate air filter capable of trapping and retaining 99.97 percent of asbestos fibers greater than 0.3 microns equivalent aerodynamic diameter.

HEPA Vacuum Equipment- Vacuuming equipment with a high efficiency particulate air filtration system.

Large Asbestos Project- An asbestos project involving the installation, removal, disturbance, enclosure or encapsulation or enclosure of 160 square feet or more of asbestos or asbestos material, or 260 linear feet or more of asbestos or asbestos material.

Minor Asbestos Project- An asbestos project involving the installation, removal, disturbance, repair, encapsulation or enclosure of 10 square feet or less of asbestos or asbestos material, or 25 linear feet or less of asbestos or asbestos material.

Negative Air Pressure Equipment- A local exhaust system equipped with HEPA filtration. The system shall be capable of creating and maintaining a negative pressure differential between the outside and the inside of the work area.

Personal Air Monitoring- A method used to determine an individual's exposure to airborne fibers. The sample is collected outside the respirator in the person's breathing zone.

Removal- The stripping of any asbestos material.

Repair- Corrective action using required work practices to control fiber release from damaged areas.

Satisfactory Clearance Air Monitoring Results- For all post-abatement samples, airborne concentrations of asbestos fibers that are less than 0.01 fibers per cubic centimeters or background levels, whichever are greater.

Small Asbestos Project- An asbestos project involving the installation, removal, disturbance, enclosure, or encapsulation of more than 10 and less than 160 square feet of asbestos or asbestos material or more than 25 and less than 260 linear feet of asbestos or asbestos material.

Appendix C

Acronyms / Abbreviations

ACM- Asbestos Containing Material

ACBM- Asbestos Containing Building Material

AHERA- Asbestos Hazard Emergency Response Act (EPA) (Public Law 99-519)

AIHA- American Industrial Hygiene Association

B - Backgrounds, Pre-Abatement

DOL- Department of Labor (NYS)

E - Environmental, During Abatement

ELAP- Environmental Laboratory Approval Program (NYS)

F - Final, Clearance

HEPA- High Efficiency Particulate Air

IB- Inside Building

IWA- Inside Work Area

LPM- Liters (of Air) per minute

NIOSH- National Institute for Occupational Safety and Health

NVLAP- National Voluntary Laboratory Program (EPA)

OB- Outside Building

OBZ- Operator Breathing Zone (personal)

OSHA- Occupational Safety and Health Administration

OWA- Outside Work Area

P - Personal, OSHA monitoring

PCM- Phase Contrast Microscopy (used for asbestos air sample analysis)

PEL- Permissible Exposure Limit- 8 hour time weighted average

PLM- Polarized Light Microscopy (used for asbestos bulk sample analysis)

STEL- Short Term Exposure Limit- 30 minute sample

TEM- Transmission Electron Microscopy

TWA- Time Weighted Average- represents airborne concentrations averaged with regard to their duration.

f/cc- Fibers per Cubic Centimeter- the number of fibers contained in one cubic centimeter of air. Used in PCM reporting

f/mm- Fibers per Millimeter squared- the number of fiber contained within one square millimeter of the filter surface. Used in PCM reporting

s/cc- Structures per Cubic Centimeter- the number of asbestos structure contained in one cubic centimeter of air. Used in TEM reporting

s/mm²- Structures per Millimeter squared- the number of asbestos structures contained within one square millimeter of the filter surface. Used in TEM reporting

MCE- Mixed Cellulose Ester (filter type)

PC- Polycarbonate (filter type)

Rule 56- Part 56 of Title 12 of the official Compilation of Rules, Rules and Regulations of the State of New York (Statutory Authority: Labor Law Section 906).

X - Field Blank



FIBER AIR SAMPLING

1.0 Applicable Analytes

- Asbestos,
- Mineral Fibers,
- Man Made Mineral Fiber,
- Organic Fibers.

2.0 References

1. NIOSH Manual of Analytical Methods, Third Edition. NIOSH 7400 Method
2. Methods of Air Sampling and Analysis, 3rd Edition, Lodge, James P., Method 822 General Atomic Absorption Procedure for Trace Metals in Airborne Material Collected on Filter.

3.0 Health and Safety

- When working with potentially hazardous materials, follow USEPA, OSHA, corporate and site/project specific health and safety procedures.

4.0 Equipment Checklist

- Sample Filter: 25 mm diameter, 0.8 or 0.45 μ m pore size, Mixed Cellulose Ester (MCE)
- Sample Cassettes: 25 mm, 3 piece conductive with end plugs & extended cowl
- Pump capable of sampling a minimum of 5 liters per minute (LPM)
- Tygon tubing of appropriate length
- Primary or Secondary flow calibration device
- Stopwatch

5.0 Special Precautions

- Sampler should take special precautions as not to become exposed to workplace hazards that they are sampling. Use of an appropriate respirator & protective clothing is recommended. See corporate Respirator Protection Plan.

- When setting up pumps care should be taken in order to avoid potential electrical hazards and tripping hazards

6.0 Sampling Procedure

1. Remove plastic end plug from either side of the cassette
2. Start a blank sample at this point; treat in every way similar with the samples except draw no air through it. Do 1 blank per sampling lot or 10% whichever is greater.
3. Label each cassette using the standard labeling system, a combination of the project #, date and sample number.
4. Calibrate each pump with a cassette prepared from the same lot the sampling filters are taken from, record the calibrations.
 - For personal air monitoring calibrate each personal pump to 2 LPM ($\pm 10\%$).
 - For area air monitoring calibrate each pump to 2 – 16 LPM, depending on required sampling duration and desired sample loading.
5. Attach prepared cassettes to calibrate pumps, with backing pad towards the pump.
6. **Remove the cassette faceplate.**
7. Place the pumps in appropriate position on employee or in work area.
 - For personnel monitoring arrange it so the cassette hangs over the employees shoulder.
 - For area monitoring place the pumps in the area of concern, several sampling locations may be required to cover the area in question.
8. Start the pump, record the start time, and allow it to run until the desired volume is achieved.
 - For personnel monitoring a minimum volume of 60L (30 minutes @ 2 LPM) and maximum volume of 960 L (8 hours @ 2 LPM) should be used as guidelines.
 - Duration of area monitoring is dependent on situations on-site. A standard flow rate of 5-15 LPM is used for most circumstances. In any case, the minimum volume should be no less than 600 L.
9. If area being sampled is dusty check filter loading often and before overloading occurs replace the filter cassettes during sampling, record time of cassette replacement and pre / post calibrate each time sample is changed.
10. Stop the pump at the desired sample volume and record time stopped.
11. Remove cassettes from sampling pump and replace the plastic end plugs on each cassette. Check to make sure the sample is labeled correctly.
12. Post calibrate the sample pump and record the value.
13. Fill out the appropriate chain of custody and/or sample data sheet, package and bring (or send) samples, blank(s) and paperwork to lab for processing and analysis.

STANDARD OPERATING PROCEDURES FOR PHASE CONTRAST MICROSCOPY ANALYSIS OF DURABLE FIBERS

PURPOSE: To examine particulates and fibers contained on a mixed cellulose ester filter and to determine an index of airborne fibers in workplace atmospheres.

REFERENCES

- NIOSH Manual of Analytical Methods, Third Edition. Method 7400.

APPARATUS & REAGENTS

Apparatus for sample preparation

- QuickFix acetone vaporizer
- Slides, glass 25 x 75 mm
- Cover slips, 22 x 22 mm, no. 1-1/2
- Syringe
- Pasteur pipet
- Knife, #10 surgical steel, curved blade
- Tweezers

Apparatus for sample analysis

- Microscope, phase contrast, with a green filter, 8 to 10X eyepiece and 40 to 45X phase objective (total magnification ca. 400X); numerical aperture of 0.65 to 0.75
- Graticule, Walton-Beckett type with 100 μ m-diameter circular field at the specimen plane (type G-22 graticule)
- Multi-counter, three button, minimum
- MICROSCORE™ counting and reporting system (optional)
- HSE/NPL phase contrast test slide, Mark II
- Telescope, ocular phase-ring centering
- Stage micrometer (0.01 mm divisions)

Reagent needed for sample preparation

- Acetone, ACS reagent grade
- Triacetin (glycerol triacetate), ACS reagent grade
- Lacquer or nail polish

PRECAUTIONS

Acetone is extremely flammable. Take precautions not to ignite it. Heating of acetone in volumes greater than 1 ml must be done in a ventilated, laboratory fume hood using a flameless, spark-free heat source. Acetone should be used in a non-smoking area.

SAMPLING

The collection of the air sample is beyond the scope of this document. It is assumed the sampling has been completed in accordance with standard OSHA or NIOSH air sampling procedures for airborne fibers.

SAMPLE PREPARATION

After it is verified that the sampler is a three-piece cassette with 50 mm electrically-conductive extension cowl. Filter diameter is preferably 25mm (37mm acceptable). Filter media is mixed cellulose ester with 0.8 or 0.45 μ m pore size.

1. Place cassette in the sample preparation staging area.
2. Turn on QuickFix..
3. Use either a curved-blade surgical knife with a rocking motion to avoid tearing, or a razor blade to score the filter in half. Bisect one of the filter pieces to produce a quarter wedge.
4. Place the quarter-filter piece on a clean glass slide labelled with the sample number. Take caution to place the filter with the dust-side up.
5. Reassemble the cassette housing with remaining filter pieces. Store the cassette in a secure location.
6. Place the glass slide in the QuickFix. Approximately 0.2 ml of reagent-grade acetone is vaporized and deposited on the glass slide.
Note: Follow manufacturer's instructions for the use of the QuickFix.
7. After the filter has cleared (usually no longer than 10 seconds), use a pasteur pipet to place on drop (3 to 3.5 μ l) of triacetin on the middle of the filter wedge.
8. Lower a coverslip onto the wedge at a slight angle.
9. Place the slide on the hot plate for approximately 30 seconds to aid in filter clearing
10. Set the slide aside to allow to cool and finish clearing. The slide is ready for analysis

SAMPLE ANALYSIS

1. If using MICROSCORE™, boot the system and follow the directions in the system manual for entering sample information.
2. Load the glass slide with the cleared-sample wedge onto the microscope stage.
3. Focus the microscope onto the plane of the filter. Adjust the light source (Kohler illumination) for even illumination across the field of view. Make sure the field iris is in focus, center on the sample, and open only enough to full illuminate the field of view.
4. Start counting from the tip of the filter wedge and progress to the outer edge. As a minimum, each analysis must cover at least one radial line from filter center to filter edge.
5. If an agglomerate or particle covers approximately 1/6 or more of the field, reject the field and advance to the next area. Record the number of rejected fields but do not include these fields in the total number counted.

A-rules (used unless otherwise specified):

1. Count only fibers longer than 5µm. Measure curved fibers along the curve.
2. Fibers must have an aspect ratio of $\geq 3:1$.
3. For fibers which cross the boundary of the graticule:
 - Count any fiber $\geq 5 \mu\text{m}$ which lies entirely in the graticule area;
 - Count as 1/2 fiber any fiber crossing the boundary but has one end in the graticule area.
 - If both ends of the fiber cross the boundary, do not count the fiber.
4. Count bundles and other structures as one fiber unless individual fibers can be identified by observing both ends of the fiber.
5. Count enough fields to yield 100 fibers. Count at least 20 fields. Stop at 100 fields regardless of the fiber count.

B-rules (used at request of client):

1. Count only the ends of fibers.
2. Fiber dimensions are: length $\geq 5 \mu\text{m}$, width $\geq 3 \mu\text{m}$, and aspect ratio $\geq 5:1$.
3. Count each appropriate fiber end which falls in the graticule area.

4. Count visibly free ends (of appropriate dimensions) when the fiber appears to be attached to another particle. If a particle $\geq 3 \mu\text{m}$ in diameter covers a fiber end, count the end.
5. Count free fiber ends emanating from bundles or other structures up to a maximum of 10 ends.
6. Count up to 200 fiber ends with a minimum of 20 graticule fields. Stop at 100 fields regardless of fiber end count.

CALCULATIONS

For each sample, calculate and report the net fiber density on the filter (fibers/mm²)

$$E = \frac{F/n_F - B/n_B}{0.00785}$$

where: $E =$ fibers/mm²
 $F =$ total fiber count on sample
 $n_F =$ total field count on sample
 $B =$ total fiber count on blank
 $n_B =$ total field count on blank

Calculate and report the fiber concentration (fibers/cc) using

$$C = \frac{(E)(Ac)}{V * 1000}$$

where $C =$ fibers per cc of air
 $E =$ fibers per mm²
 $Ac =$ effective filter area (385 mm² for 25 mm filter)
 $V =$ air volume sampled (liters)

Report a 95% confidence level using the following equations:

$$\begin{aligned} \text{LCL} &= C - 1.645 * CV * C \\ \text{UCL} &= C + 1.645 * CV * C \end{aligned}$$



GENERAL AIR SAMPLING GUIDELINES

SOP#: 2008
DATE: 11/16/94
REV. #: 0.0

1.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) provides guidance in developing and implementing sampling plans to assess the impact of hazardous waste sites on ambient air. It presents the United States Environmental Protection Agency/Environmental Response Team's (U.S. EPA/ERT's) approach to air sampling and monitoring and identifies equipment requirements. It is not within the scope of this SOP to provide a generic air sampling plan. Experience, objectives, site characteristics, and chemical characteristics will dictate sampling strategy. This SOP does not address indoor air sampling.

Two basic approaches can be used to assess ambient air (also referred to as air pathway assessments): modeling and measurements. The modeling approach initially estimates or measures the overall site emission rate(s) and pattern(s). These data are input into an appropriate air dispersion model, which predicts either the maximum or average air concentrations at selected locations or distances during the time period of concern. This overall modeling strategy is presented in the first three volumes of the Air Superfund National Technical Guidance Series on Air Pathway Assessments^(1,2,3). Specific applications of this strategy are presented in several additional Air Superfund Technical Guidance documents⁽⁴⁾.

The measurement approach involves actually measuring the air impact at selected locations during specific time periods. These measurements can be used to document actual air impacts during specific time intervals (i.e., during cleanup operations) or to extrapolate the probable "worst case" concentration at that and similar locations over a longer time period than was sampled.

This SOP addresses issues associated with this second assessment strategy. This SOP also discusses the U.S. EPA/ERT's monitoring instruments, air sampling

kits, and approach to air sampling and monitoring at hazardous waste sites.

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, depending on site conditions, equipment limitations, or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. EPA endorsement or recommendation for use.

2.0 METHOD SUMMARY

Air monitoring is defined as the use of direct-reading instruments and other screening or monitoring equipment and techniques that provide instantaneous (real-time) data on the levels of airborne contaminants. The U.S. EPA/ERT maintains numerous monitors for real-time measurements. Examples of air monitoring equipment are hand-held photoionization detectors (PID), flame ionization detectors (FID), oxygen/combustible gas detectors, and remote optical sensors.

Air sampling is defined as those sampling and analytical techniques that require either off- or on-site laboratory analysis and therefore do not provide immediate results. Typically, air sampling occurs after use of real-time air monitoring equipment has narrowed the number of possible contaminants and has provided some qualitative measurement of contaminant concentration. Air sampling techniques are used to more accurately detect, identify and quantify specific chemical compounds relative to the majority of air monitoring technologies.

In the Superfund Removal Program, On-Scene Coordinators (OSCs) may request the U.S. EPA/ERT to conduct air monitoring and sampling during the

following situations: emergency responses, site assessments, and removal activities. Each of these activities has a related air monitoring/sampling objective that is used to determine the potential hazards to workers and/or the community.

C Emergency Response

Emergency responses are immediate responses to a release or threatened release of hazardous substances presenting an imminent danger to public health, welfare, or the environment (i.e., chemical spills, fires, or chemical process failures resulting in a controlled release of hazardous substances). Generally these situations require rapid on-site investigation and response. A major part of this investigation consists of assessing the air impact of these releases.

C Removal Site Assessment

Removal site assessments (referred to as site assessments) are defined as any of several activities undertaken to determine the extent of contamination at a site and which help to formulate the appropriate response to a release or threatened release of hazardous substances. These activities may include a site inspection, multimedia sampling, and other data collection.

C Removal Actions

Removal actions clean up or remove hazardous substances released into the environment. Removal actions include an activity conducted to abate, prevent, minimize, stabilize, or eliminate a threat to public health or welfare, or to the environment.

Personal risk from airborne contaminants can be determined by comparing the results of on-site monitoring and sampling to health-based action levels such as the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) and the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs). Residential risk can be determined by comparing the results of off-site monitoring or sampling to health-based action levels such as those developed by the Agency for Toxic Substances and

Disease Registry (ATSDR).

The extent to which valid inferences can be drawn from air monitoring/sampling depends on the degree to which the monitoring/sampling effort conforms to the objectives of the event. Meeting the project's objectives requires thorough planning of the monitoring/sampling activities, and implementation of the most appropriate monitoring/sampling and analytical procedures. These issues will be discussed in this SOP.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Preservation, containers, handling and storage for air samples are discussed in the specific SOPs for the technique selected. In addition, the analytical method (i.e., U.S. EPA, National Institute for Occupational Safety and Health [NIOSH], and OSHA Methods) may be consulted for storage temperature, holding times and packaging requirements. After sample collection, the sampling media (i.e., cassettes or tubes) are immediately sealed. The samples are then placed into suitable containers (i.e., whirl bags, resealable bags or culture tubes) which are then placed into a shipping container.

Use bubble wrap or styrofoam peanuts when packing air samples for shipment. DO NOT USE VERMICULITE.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

Upwind sources can contribute to sample concentration. Natural sources, such as biological waste, can produce hydrogen sulfide and methane which may contribute to the overall contaminant level. Extraneous anthropogenic contaminants (i.e., burning of fossil fuels; emissions from vehicular traffic, especially diesel; volatile compounds from petrochemical facilities; and effluvia from smoke stacks) may also contribute. Air sampling stations should be strategically placed to identify contributing sources.

Photoreactivity or reaction of the parameters of concern may occur with nonrelated compounds [i.e., nitrogen compounds and polyaromatic hydrocarbons

(PAHs)]. Some sorbent media/samples should not be exposed to light during or after sampling due to photochemical effects (i.e., PAHs).

Various environmental factors, including humidity, temperature and pressure, also impact the air sampling methodology, collection efficiency and detection limit. Since the determination of air contaminants is specifically dependent on the collection parameters and efficiencies, the collection procedure is an integral part of the analytical method.

Detection limits depend on the contaminants being investigated and the particular site situation. It is important to know why the data are needed and how the data will be used. Care should be taken to ensure the detection limits are adequate for the intended use of the final results.

Some equipment may be sensitive to humidity and temperature extremes.

5.0 EQUIPMENT/APPARATUS

5.1 Direct Reading Instruments (Air Monitoring Instruments)

There are two general types of direct reading instruments: portable screening devices and specialized analytical instruments. Generally all these techniques involve acquiring, for a specific location or area, continuous or sequential direct air concentrations in either a real-time or semi-real-time mode. None of these instruments acquires true time-weighted average concentrations. In addition, these instruments are not capable of acquiring simultaneous concentration readings at multiple locations, although several are able to sequentially analyze samples taken remotely from different locations. The document, "Guide to Portable Instruments for Assessing Airborne Pollutants Arising from Hazardous Waste Sites ⁽⁵⁾," provides additional information about air sampling and monitoring. The hazard levels for airborne contaminants vary. See the ACGIH TLVs and the OSHA PELs for safe working levels. Common screening devices and analytical instruments are described in Appendix A.

5.2 Air Sampling Equipment and Media/Devices

The U.S. EPA/ERT uses the following analytical

methods for sampling: *NIOSH Manual of Analytical Methods* ⁽⁶⁾, *American Society for Testing and Materials (ASTM) Methods* ⁽⁷⁾, *U.S. EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air* ^(8,9), and *OSHA Methods* ⁽¹⁰⁾. Additional air sampling references include *Industrial Hygiene and Toxicology* (3rd Ed.) ⁽¹¹⁾ and *Air Sampling Instruments for Evaluation of Atmospheric Contaminants* ⁽¹²⁾. These methods typically specify equipment requirements for sampling. Since air sampling is such a diverse technology, no single method or reference is best for all applications. Common sampling equipment and media/devices are described in Appendix B.

5.3 Tools/Material and Equipment List

In addition to equipment and materials identified in Appendices A and B, the following equipment and materials may be required to conduct air sampling and monitoring at hazardous waste sites:

- C Camera
- C Site logbook
- C Clipboard
- C Chain of custody records
- C Custody seals
- C Air sampling worksheets
- C Sample labels
- C Small screwdriver set
- C Aluminum foil
- C Extension cords
- C Glass cracker
- C Multiple plug outlet
- C Whirl bags or culture tubes
- C Teflon tape
- C Calibration devices
- C Tygon and/or Teflon[®] tubing
- C Surgical gloves
- C Lint-free gloves
- C Ice
- C Sample container

Use the following additional equipment when decontaminating glassware on site:

- C Protective equipment (i.e., gloves, splash goggles, etc.)
- C Appropriate solvent(s)
- C Spray bottles
- C Liquinox (soap)
- C Paper towels

- C Distilled/deionized water
- C Five-gallon buckets
- C Scrub brushes and bottle brushes

6.0 REAGENTS

Impinger sampling involves using reagents contained in a glass vial to absorb contaminants of concern (for example, NIOSH Method 3500 for formaldehyde uses 1% sodium bisulfite solution). Impinger solutions vary and are method-dependent.

Reagents such as acetone and hexane are required to decontaminate glassware and some air sampling equipment. Decontamination solutions are specified in the Sampling Equipment Decontamination SOP.

7.0 PROCEDURES

7.1 Air Monitoring Design

7.1.1 Initial Surveys

In general, the initial survey is considered to be a relatively rapid screening process for collecting preliminary data at hazardous waste sites. However, initial surveys may require many hours to complete and may consist of more than one entry.

Some information is generally known about the site; therefore, real-time instrumentation for specific compounds (i.e., detector tubes and electrochemical sensors) can be used to identify hot spots. Sufficient data should be obtained with real-time instruments during the initial entry to screen the site for various contaminants. When warranted, intrinsically safe or explosion-proof instruments should be used. An organic vapor analyzer (OVA) is typically used during this survey. These gross measurements may be used on a preliminary basis to (1) determine levels of personal protection, (2) establish site work zones, and (3) map candidate areas for more thorough qualitative and quantitative studies involving air sampling.

In some situations, the information obtained may be sufficient to preclude additional monitoring. Materials detected during the initial survey may call for a more comprehensive evaluation of hazards and analyses for specific compounds. Since site activities and weather conditions change, a continuous program to monitor the ambient atmosphere must be established.

7.1.2 Off-Site Monitoring

Typically, perimeter monitoring with the same instruments employed for on-site monitoring is utilized to determine site boundaries. Because air is a dynamic matrix, physical boundaries like property lines and fences do not necessarily delineate the site boundary or area influenced by a release. Whenever possible, atmospheric hazards in the areas adjacent to the on-site zone should be monitored with direct-reading instruments. Monitoring at the fenceline or at varying locations off site provides useful information regarding pollutant migration. Three to four locations downwind of the source (i.e., plume) at breathing-zone height, provide a basic fingerprint of the plume. Negative instrument readings off site should not be interpreted as the complete absence of airborne toxic substances; rather, they should be considered another piece of information to assist in the preliminary evaluation. The interpretation of negative readings is instrument-dependent. The lack of instrument readings off site should not be interpreted as the complete absence of all airborne toxic substances; rather, it is possible that the particular compound or class of compounds to which the monitoring instrument responds is not present or that the concentration of the compound(s) is below the instrument's detection limit.

7.2 Air Sampling Design

7.2.1 Sampling Plan Design

The goal of air sampling is to accurately assess the impact of a contaminant source(s) on ambient air quality. This impact is expressed in terms of overall average and/or maximum air concentrations for the time period of concern and may be affected by the transport and release of pollutants from both on- and off-site sources. The location of these sources must be taken into account as they impact the selection of sampling locations. Unlike soil and groundwater concentrations, air concentrations at points of interest can easily vary by orders of magnitude over the period of concern. This variability plays a major role in designing an air sampling plan.

Downwind air concentration is determined by the amount of material being released from the site into the air (the emission rate) and by the degree that the contamination is diluted as it is transported. Local

meteorology and topography govern downwind dilution. Contaminant emission rates can also be heavily influenced by on-site meteorology and on-site activities. All of these concerns must be incorporated into an air sampling plan.

A sampling strategy can be simple or complex, depending on the sampling program objectives. Programs involving characterization of the pollutant contribution from a single point source tend to be simple, whereas sampling programs investigating fate and transport characteristics of components from diverse sources require a more complex sampling strategy. In addition, resource constraints may affect the complexity of the sampling design.

An optimal sampling strategy accounts for the following site parameters:

- C Location of stationary as well as mobile sources
- C Analytes of concern
- C Analytical detection limit to be achieved
- C Rate of release and transport of pollutants from sources
- C Availability of space and utilities for operating sampling equipment
- C Meteorological monitoring data
- C Meteorological conditions in which sampling is to be conducted

The sampling strategy typically requires that the concentration of contaminants at the source or area of concern as well as background contributions be quantified. It is important to establish background levels of contaminants in order to develop a reference point from which to evaluate the source data. Field blanks and lot blanks, as well as various other types of QA/QC samples, can be utilized to determine other sources. The impact of extraneous sources on sampling results can frequently be accounted for by placing samplers upwind, downwind and crosswind from the subject source. The analytical data from these different sampling locations may be compared to determine statistical differences.

7.2.2 Sampling Objectives

The objectives of the sampling must be determined prior to developing the sampling plan. Does the sampling plan verify adequate levels of protection for on-site personnel, or address potential off-site impacts

associated with the site or with site activities? In addition, the assumptions associated with the sampling program must be defined. These assumptions include whether the sampling is to take place under "typical," "worst case," or "one-time" conditions. If the conditions present at the time of sampling are different from those assumed during the development of the sampling plan, then quality of the data collected may be affected. The following definitions have been established:

- C Typical: routine daily sampling or routine scheduled sampling at pre-established locations.
- C Worst case: sampling conducted under the worst meteorological and/or site conditions which would result in elevated ambient concentrations.
- C One-time: only one chance is given to collect a sample without regard to time or conditions.

Qualitative data acquired under these conditions are usually applicable only to the time period during which the data were collected and may not provide accurate information to be used in estimating the magnitude of an air impact during other periods or over a long time interval.

The sampling objectives also dictate the detection limits. Sampling methods for airborne contaminants will depend upon the nature and state (solid, liquid or gas) of the contaminant. Gases and vapors may be collected in aqueous media or adsorbents, in molecular sieves, or in suitable containers. Particulates are collected by filters or impactors. The volume of sample to be collected is dependent upon an estimate of the contaminant concentration in the air, the sensitivity of the analytical method, and the standard or desired detection limit. A sufficient amount of sample must be collected to achieve the desired detection limit without interference from other contaminants. In addition, the selected method must be able to detect the target compound(s).

7.2.3 Location and Number of Individual Sampling Points

Choose the number and location of sampling points according to the variability, or sensitivity, of the sampling and analytical methods being utilized, the variability of contaminant concentration over time at the site, the level of precision required and cost limitations. In addition, determine the number of locations and placement of samplers by considering the nature of the response, local terrain, meteorological conditions, location of the site (with respect to other conflicting background sources), size of the site, and the number, size, and relative proximity of separate on-site emission sources and upwind sources. The following are several considerations for sampler placement:

- C Location of potential on-site emission sources, as identified from the review of site background information or from preliminary on-site inspections.
- C Location of potential off-site emission sources upwind of the sampling location(s). Review local wind patterns to determine the location of off-site sources relative to wind direction.

- C Topographic features that affect the dispersion and transport of airborne toxic constituents.

Avoid natural obstructions when choosing air sampling station locations, and account for channelization around those obstructions.

- C Large water bodies, which affect atmospheric stability and the dispersion of air contaminants.
- C Roadways (dirt or paved), which may generate dust that could mask site contaminants.
- C Vegetation, such as trees and shrubs, which stabilizes soil and retards subsurface contaminants from becoming airborne. It also affects air flow and scrubs some contaminants from the air. Sometimes thick vegetation can make an otherwise ideal air monitoring location inaccessible.

Consider the duration of sampling activities when choosing the location and number of samples to be collected. For example, if the sampling period is limited to a few hours, one or two upwind and several downwind samples would typically be adequate, especially around major emission sources.

A short-term monitoring program ranges from several days to a few weeks and generally includes gathering data for site assessments, removal actions, and source determination data (for further modeling). Activities involved in a short-term sampling strategy must make the most of the limited possibilities for data collection. Consider moving upwind/downwind locations daily based on National Oceanic and Atmospheric Administration (NOAA) weather forecasts. Weather monitoring becomes critical where complex terrain and local meteorological effects frequently change wind direction. Often, a number of alternatives can fulfill the same objective.

Prevailing winds running the length of a valley usually require a minimum number of sampler locations; however, a complex valley may require more sampler locations to account for the wide variety of winds. Ocean/lake effects may require a radical plan to collect enough samples to reach a low detection limit. Two sets of samplers may be placed next to each other: one set would be activated during the sea breeze

while the other set is turned off, and vice versa when there is no sea breeze. After the sampling event, the respective upwind and downwind samples would be combined. Another alternative for sampling near a large body of water may be to use automatic, wind-vector-operated samplers, which turn the sampler on only when the wind comes from a specified vector. At sites located on hillsides, wind will move down a valley and produce an upward fetch at the same time. Sampling locations may have to ring the site to measure the wind's impact.

Off-site sources may affect on-site monitoring. In this case, on-site meteorological data, concurrent with sampling data, is essential to interpreting the acquired data. Also, additional upwind sampling sites may be needed to fully characterize ambient background contaminant levels. Multiple off-site sources may require several monitoring locations, but if the sources are at a sufficient distance, only one monitoring location is needed.

Topography and weather are not the only factors in sampler location; the sampling sites must be secure from vandals and mishap. Secure all sampling locations to maintain chain of custody, and to prevent tampering with samples or loss of sampling units. High-volume sampling methods often require the use of 110 VAC electric power. When portable generators are used, the power quality may affect sampler operation. Also, be aware that the generators themselves could be a potential pollution source if their placement is not carefully considered.

Air quality dispersion models can be used to place samplers. The models incorporate source information, surrounding topography, and meteorological data to predict the general distance and directions of maximum ambient concentrations. Modeling results should be used to select sampling locations in areas of maximum pollutant concentrations.

7.2.4 Time, Duration and Frequency of Sampling Events

After choosing appropriate sampling or monitoring locations, determine the sampling frequency and the number of samples to be collected. The time of day, duration and frequency of sampling events is governed by:

- C The effects of site activities and meteorology

on emission rates

- C The diurnal effect of the meteorology on downwind dispersion
- C The time period(s) of concern as defined by the objective
- C The variability in the impact from other non-site-related sources
- C If defined, the degree of confidence needed for either the mean or maximum downwind concentrations observed
- C The precision requirements for single measurements
- C Cost and other logistical considerations

The duration of the removal action and the number of hours per day that site work is conducted determine the time, duration, and frequency of samples. Short-term sampling programs may require daily sampling, while long-term programs may require 24-hour sampling every sixth or twelfth day. If the site will be undergoing removal activities 24 hours a day, continuous air sampling may be warranted. However, if the site activities will be conducted for only eight hours a day, and there are no emissions likely to occur during the remaining 16 hours, then sampling would be appropriate prior to the start of daily activities, would continue during operations, and end at the conclusion of the daily activities. An off-peak sample collection can ensure that emissions are not persisting after the conclusion of daily cleanup activities. For some sites, emissions are still a factor several hours after daily site activities have been completed. Because of the typically decreased downwind dispersion in the evening, higher downwind concentrations than were present during daytime site activities may be detected. For sites where this is possible, the sampling duration needs to be lengthened accordingly.

Sampling duration and flow rate dictate the volume of air collected, and to a major degree, the detection limit. The analytical method selected will provide a reference to flow rate and volume. Flow rates are limited to the capacity of the pumps being employed and the contact time required by the collection media.

The duration or period of air sampling is commonly divided into two categories (1) samples collected over a brief time period are referred to as "instantaneous" or "grab" samples and are usually collected in less than five minutes and (2) average or integrated samples are collected over a significantly longer period of time. Integrated samples provide an average

concentration over the entire sampling period. Integrated samples are not suited to determining cyclical releases of contaminants because periodic or cyclical events are averaged out by the proportionally long sampling duration.

Air quality dispersion models can predict the maximum air contaminant concentration expected from a source. The meteorological and site conditions expected to cause the highest concentration are known as worst-case conditions and can be identified by analyzing the modeling results. Depending upon the objective, one may sample when the model predicts worst-case conditions will exist.

7.2.5 Meteorological and Physical/Chemical Considerations

A meteorological monitoring program is an integral part of site monitoring activities. Meteorological data, which define local terrain impacts on air flow paths, are needed to interpret air concentration data. Meteorological data may be available from an existing station located near the site (i.e., at a local airport), otherwise a station should be set up at the site. This data will document the degree that samples actually were downwind and verify whether other worst-case assumptions were met. Meteorological parameters to be monitored are, at a minimum, wind speed, wind direction, and sigma theta (which is the horizontal wind direction standard deviation and an indicator of atmospheric stability). The remaining parameters primarily affect the amount of a contaminant available in the air.

C Wind Speed

When the contaminant of concern is a particulate, wind speed is critical in determining whether the particulate will become airborne, the quantity of the particulate that becomes airborne, and the distance the particulate will travel from the source. Wind speed also contributes to the volatilization of contaminants from liquid sources.

C Wind Direction

Wind direction highly influences the path of airborne contaminants. In addition, variations in wind direction increase the

dispersion of pollutants from a given source.

C Atmospheric Stability

Atmospheric stability refers to the degree to which the atmosphere tends to dampen vertical and horizontal motion. Stable atmospheric conditions (i.e., evenings) result in low dispersion, and unstable atmospheric conditions (i.e., hot sunny days) result in higher dispersion.

C Temperature

Higher temperatures increase the rate of volatilization of organic and some inorganic compounds and affect the initial rise of gaseous or vapor contaminants. Therefore, worst-case emission of volatiles and semivolatiles occurs at the hottest time of day, or on the hottest day.

C Humidity

High humidity affects water-soluble chemicals and particulates. Humid conditions may dictate the sampling media used to collect the air sample, or limit the volume of air sampled and thereby increase the detection limit.

C Atmospheric Pressure

Migration of landfill gases through the landfill surface and through surrounding soils are governed by changes in atmospheric pressure. Atmospheric pressure will influence upward migration of gaseous contaminants from shallow aquifers into the basements of overlying structures.

In many cases, the transport and dispersion of air pollutants is complicated by local meteorology. Normal diurnal variations (i.e., temperature inversions) affect dispersion of airborne contaminants. Terrain features can enhance or create air inversions and can also influence the path and speed of air flow, complicating transport and dispersion patterns.

The chemical characteristics of a contaminant (i.e., molecular weight, physical

state, vapor pressure, aerodynamic size, temperature, reactive compounds, and photodegradation) affects its behavior and can influence the method used to sample and analyze it.

8.0 CALCULATIONS

Volume is obtained by multiplying the sample time in minutes by the flow rate. Sample volume should be indicated on the chain of custody record. Adjustments for temperature and pressure differences may be required.

Results are usually provided in parts per million (ppm), parts per billion (ppb), milligrams per cubic meter (mg/m^3) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

Refer to the analytical method or regulatory guidelines for other applicable calculations.

9.0 QUALITY ASSURANCE/ QUALITY CONTROL

The manufacturer's instructions should be reviewed prior to instrument use. Instruments must be utilized in accordance with manufacturer's instructions. Equipment checkout and calibration activities must occur prior to and after monitoring and sampling and must be documented.

9.1 QA/QC Samples

QA/QC samples provide information on the variability and usability of environmental sample results. Various QA/QC samples may be collected to detect error. QA/QC samples are submitted with the field samples for analysis to aid in identifying the origin of analytical discrepancies; then a determination can be made as to how the analytical results should be used. Collocated samples, background samples, field blanks, and lot blanks are the most commonly collected QA/QC field samples. Performance evaluation (PE) samples and matrix spikes provide additional measures of data QA/QC control. QA/QC results may suggest the need for modifying sample collection, preparation, handling, or analytical procedures if the resultant data do not meet site-specific QA or data quality objectives.

9.2 Sample Documentation

All sample and monitoring activities should be documented legibly, in ink. Any corrections or revisions should be made by lining through the incorrect entry and by initialing the error. All samples must be recorded on an Air Sampling Worksheet. A chain of custody record must be maintained from the time a sample is taken to the final disposition of the sample. Custody seals demonstrate that a sample container has not been opened or tampered with during transport or storage of samples.

10.0 DATA VALIDATION

Results for QA/QC samples should be evaluated for contamination. This information should be utilized to qualify the environmental sample results accordingly with data quality objectives.

11.0 HEALTH AND SAFETY

Personal protection equipment (PPE) requirements identified in federal and/or state regulations and 29 Code of Federal Regulations (CFR) 1910.120 for hazardous waste site work must be followed.

The majority of physical precautions involved in air sampling are related to the contaminant sampled. Attention should be given when sampling in potentially explosive, flammable or acidic atmospheres. On rare occasions, the collection media may be hazardous; for example, in the instance where an acidic or basic solution is utilized in an impinger.

When working with potentially hazardous materials, follow U.S. EPA, OSHA and corporate health and safety procedures.

12.0 REFERENCES

- (1) U.S. EPA. *Air Superfund National Technical Guidance Series. Volume I. Application of Air Pathway Analyses for Superfund Activities*. EPA/450/1-89/001.
- (2) U.S. EPA. *Air Superfund National Technical Guidance Series. Volume II. Estimation of Baseline Air Emissions at Superfund Sites*. EPA/450/1-89/002.
- (3) U.S. EPA. *Air Superfund National Technical Guidance Series. Volume III*.

Estimations of Air Emissions from Cleanup Activities at Superfund Sites . EPA/450/1-89/003.

- (4) U.S. EPA. *Air Superfund National Technical Guidance Series. Volume IV. Procedures for Dispersion Air Modeling and Air Monitoring for Superfund Air Pathway Analysis* . EPA/450/1-89/004.

- (5) *Guide to Portable Instruments for Assessing Airborne Pollutants Arising from Hazardous Wastes*, International Organization of Legal Metrology (OIML) U.S. National Working Group (NWG) for OIML, American Conference of Governmental Industrial Hygienists, Cincinnati, OH

- (6) NIOSH. *Manual of Analytical Methods, Second Edition. Volumes 1-7* . U.S. Department of Health and Human Services Publication No. 84-100.

NIOSH. *Manual of Analytical Methods* , February 1984. U.S. Department of Health and Human Services Publication No. 84-100.

- (7) ASTM. 1990. *Annual Book of Standards* , Volume 11.03 .

- (8) Riggin, R.M. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air* . EPA/600/4-84/041.

- (9) Winberry, W.T. *Supplement to U.S. EPA/600/4-84/041: Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air* . EPA/600/4-87/006.

- (10) OSHA. *Analytical Methods Manual, Second Edition. Part 1, Organic Substances* , January 1990. *Part 2, Inorganic Substances* August 1991.

- (11) Patty, F.A., *Industrial Hygiene and Toxicology, Third Edition* , John Wiley and Sons, Inc., New York, NY.

- (12) *Air Sampling Instruments for Evaluation of Atmospheric Contaminants, Seventh Edition*, 1989, American Conference of Governmental Industrial Hygienists, Cincinnati, OH

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APPENDIX A

Portable Screening Devices and Specialized Analytical Instruments

PORTABLE SCREENING DEVICES

Where possible, a datalogger should be used to minimize the length of time required for site personnel to be in a potentially contaminated area. Datalogger cable is available from manufacturers for linear output instruments and some nonlinear output instruments. U.S. EPA ERT/REAC has output cables for organic vapor analyzers (i.e., HNU and OVA), toxic gas analyzers (i.e., monitox) and real-time aerosol monitors (i.e., RAM and miniram).

C Total Hydrocarbon Analyzers

Total hydrocarbon analyzers used to detect a variety of volatile organic compounds (VOCs) at hazardous waste sites principally employ either a photoionization detector (PID) or a flame ionization detector (FID). Compounds are ionized by a flame or a ultraviolet lamp. PIDs depend on the ionization potential of the compounds. PIDs are sensitive to aromatic and olefinic (unsaturated) compounds such as benzene, toluene, styrene, xylenes, and acetylene. Greater selectivity is possible by using low-voltage lamps. The ionization potential of individual compounds can be found in the NIOSH Pocket Guide to Chemical Hazards. These instruments are not compound-specific and are typically used as screening instruments. FIDs are sensitive to volatile organic vapor compounds such as methane, propanol, benzene and toluene. They respond poorly to organic compounds lacking hydrocarbon characteristics.

C Oxygen and Combustible Gas Indicators

Combustible Gas Indicators (CGIs) provide efficient and reliable methods to test for potentially explosive atmospheres. CGI meters measure the concentration of a flammable vapor or gas in air and present these measurements as a percentage of the lower explosive limit (LEL).

The measurements are temperature-dependent. The

property of the calibration gas determines sensitivity.

LELs for individual compounds can be found in the NIOSH Pocket Guide to Chemical Hazards. If readings approach or exceed 10 % of the LEL, extreme caution should be exercised in continuing the investigation. If readings approach or exceed 25 % LEL, personnel should be withdrawn immediately.

CGIs typically house an electrochemical sensor to determine the oxygen concentration in ambient air. Normally, air contains approximately 20.9% oxygen by volume. Oxygen measurements are of particular importance for work in enclosed spaces, low-lying areas, or in the vicinity of accidents that have produced heavier-than-air vapors which could displace ambient air. The meters are calibrated for sea level and may indicate a false negative (i.e., O₂ content) at higher altitudes. Since the air has been displaced by other substances, these oxygen-deficient areas are also prime locations for taking additional organic vapor and combustible gas measurements. Oxygen-enriched atmospheres increase the potential for fires by their ability to contribute to combustion or to chemically react with flammable compounds and promote auto-ignition.

C Toxic Atmosphere Analyzers

The toxic atmosphere analyzer is a compound-specific instrument, designed and calibrated to identify and quantify a specific compound or class of compounds in either gaseous or vapor form. Cross-sensitivity to air pollutants not of interest may be lead to erroneous results.

U.S. EPA/ERT has the following toxic atmosphere analyzers: carbon monoxide, phosgene, nitrous oxide, hydrogen cyanide, sulfur dioxide, hydrogen sulfide, and chlorine gas.

C Aerosol/Particulate Monitors

A Real-Time Aerosol/Particulate Monitor (RAM) displays readings for total particulates. The instrument employs a pulse light emitting diode which generates a narrow band emission in conjunction with a photovoltaic cell to detect light scattered from particulates.

The U.S. EPA/ERT uses the RAM when the contaminant of concern is associated with particulates, and when responding to fires involving hazardous materials, to identify plume levels. The instrument is very useful in determining the presence of a plume when it is not visible. The U.S. EPA/ERT typically uses RAMs on tripods to obtain particulate concentrations at the breathing zone level. Personal dataloggers are used with the RAMs to document minimum, average and maximum concentrations. This provides real-time data without requiring those in personal protective equipment to be constantly present in the plume.

C Chemical Detector Tubes (Colorimetric Tubes)

A chemical detector tube is a hollow, tube-shaped, glass body containing one or more layers of chemically impregnated inert material. To use, the fused ends are broken off and a manufacturer-specified volume of air is drawn through the tube with a pump to achieve a given detection limit. The chemicals contained within the packing material undergo a chemical reaction with the airborne pollutant present, producing a color change during the intake of each pump stroke. The concentration of a pollutant is indicated by the length of discoloration on a calibrated scale printed on the detector tube.

C Radiation Meters

Radiation meters determine the presence and level of radiation. The meters use a gas or solid ion detection media which become ionized when radiation is present. The meters are normally calibrated to one probe. Meters that detect alpha, beta, and gamma radiation are available.

C Gold Film (Hydrogen Sulfide and Mercury Vapor) Monitors

Hydrogen sulfide (H_2S) and Mercury (Hg) monitors operate on the principle that electric resistivity increases across a gold film as a function of H_2S and Hg concentration. These monitors provide rapid and relatively low detection limits for H_2S and Hg in air. After extensive sampling periods or high concentrations of H_2S and Hg , the gold film must be heated to remove contamination and return the monitor to its original sensitivity.

C Infrared Detectors

Infrared detectors such as the Miniature Infrared Analyzer (MIRAN) use infrared (IR) absorption as a function of specific compounds. MIRAN instruments apply to situations where the contaminants are identified but concentrations are not. MIRAN instruments generally require AC power.

C Remote Optical Sensing

This technique, also referred to as long-path or open-path monitoring, involves transmitting either an infrared or ultraviolet light beam across a long open path and measuring the absorbance at specific wavelengths. The technique is capable of analyzing any preselected organic or inorganic volatile compound that can be resolved from compounds naturally occurring in ambient air. Current projected removal applications include perimeter monitoring during site cleanups and measurement of emission source strengths during site assessments.

SPECIALIZED ANALYTICAL INSTRUMENTS

The continuous monitors described above provide qualitative measurement of air contaminants. Quantitative measurements in the field can be obtained using more sophisticated instruments, such as portable Gas Chromatographs, to analyze grab samples.

C Direct Air Sampling Portable Gas Chromatographs (GCs)

Portable GCs use gas chromatography to identify and quantify compounds. The time it takes for a compound to move through a chromatographic column is a function of that specific compound or group of compounds. A trained technician with knowledge of the range of expected concentrations of compounds can utilize a portable GC in the field to analyze grab samples. GCs generally require AC power and shelter to operate. This method is limited by its reliance on a short-term grab sample to be representative of the air quality at a site.

C TAGA Direct Air Sampling Mass Spectrometer/Mass Spectrometer

The Trace Atmospheric Gas Analyzer (TAGA), which is operated by the U.S. EPA/ERT, is capable of real-time detection of preselected organic compounds at low parts-per-billion concentrations. The instrument has been successfully used by the U.S. EPA/ERT for isolating individual emission plumes and tracking those plumes back to their sources.

APPENDIX B

Air Sampling Equipment and Media/Devices

AIR SAMPLING EQUIPMENT

C High-Volume, Total Suspended Particulate (TSP) Samplers

High-volume TSP samplers collect all suspended particles by drawing air across an 8- by 10-inch glass-quartz filter. The sample rate is adjusted to 40 cubic feet per minute (CFM), or 1134 liters per minute (L/min), and it is held constant by a flow controller over the sample period. The mass of TSPs can be determined by weighing the filter before and after sampling. The composition of the filter varies according to the analytical method and the detection limit required.

C PM-10 Samplers

PM-10 samplers collect particulates with a diameter of 10 microns or less from ambient air. Particulates of this size represent the respirable fraction, and thus are of special significance. PM-10 samplers can be high-volume or low-volume. The high-volume sampler operates in the same manner as the TSP sampler at a constant flow rate of 40 CFM; it draws the sample through a special impactor head which collects particulates of 10 microns or less. The particulate is collected on an 8- by 10-inch filter. The low-volume sampler operates at a rate of approximately 17 L/min. The flow must remain constant through the impactor head to maintain the 10-micron cut-off point. The low-volume PM-10 collects the sample on 37-mm Teflon filters.

C High-Volume PS-1 Samplers

High-volume PS-1 samplers draw a sample through polyurethane foam (PUF) or a combination foam and XAD-2 resin plug, and a glass quartz filter at a rate of 5-10 CFM (144 to 282 L/min). This system is

excellent for measuring low concentrations of semivolatiles, PCBs, pesticides, or chlorinated dioxins in ambient air.

C Area Sampling Pumps

These pumps provide flow-rate ranges of 2-20 L/min and have a telescopic sampling mast with the sampling train. Because of the higher volume, this pump is suitable for sampling low concentrations of airborne contaminants (i.e., asbestos sampling). These pumps are also used for metals, pesticides and PAH sampling which require large sample volumes.

C Personal Sampling Pumps

Personal sampling pumps are reliable portable sampling devices that draw air samples through a number of sampling media including resin tubes, impingers, and filters. Flow rates are usually adjustable from 0.1 to 4 L/min (or 0.01 to .75 L/min with a restrictive orifice) and can remain constant for up to 8 hours on one battery charge or continuously with an AC charger/converter.

C Canister Samplers

Evacuated canister sampling systems use the pressure differential between the evacuated canister and ambient pressure to bleed air into the canister. The sample is bled into the canister at a constant rate over the sampling period using a critical orifice, a mechanically compensated regulator, or a mass flow control device until the canister is near atmospheric pressure.

Pressure canister sampling systems use a pump to push air into the canister. To maintain a higher, more controlled flow, the pump typically controls the pressure differential across a critical orifice at the

inlet of the canister, resulting in a pressurized canister at the completion of sampling.

AIR SAMPLING MEDIA/DEVICES

If possible, before employing a specific sampling method, consult the laboratory that will conduct the analyses. Many of the methods can be modified to provide better results or a wider range of results.

C Summa[®] Canisters

Summa canisters are highly polished passivated stainless steel cylinders. The Summa polishing process brings chrome and nickel to the surface of the canisters, which results in an inert surface. This surface restricts adsorption or reactions that occur on the canister's inner surface after collection. At the site, the canister is either placed in a sampler to control sample collection rate, or opened to collect a grab sample. Samples can be collected by allowing air to bleed into or be pumped into the canister. U.S. EPA/ERT uses 6-liter Summa canisters for VOC and permanent gas analysis.

C Passive Dosimeters

Passive dosimeters are clip-on vapor monitors (samplers) in which the diffuse contaminants are absorbed on specially prepared active surfaces. Industrial hygienists commonly use dosimeters to obtain time-weighted averages or concentrations of chemical vapors, as they can trap over 130 organic compounds. Selective dosimeters have also been developed for a number of chemicals including formaldehyde, ethylene oxide, hydrogen sulfide, mercury vapor, nitrogen dioxide, sulfur dioxide, and ozone. Dosimeters must be sent to a laboratory for analysis.

C Polyurethane Foam (PUF)

PUF is a sorbent used with a glass filter for the collection of semivolatile organic compounds such as pesticides, PCBs, chlorinated dioxins and furans, and PAHs. Fewer artifacts (chemical changes that occur

to collected compounds) are produced than with some other solid sorbents. PUF is used with the PS-1 sampler and U.S. EPA Method TO13. PUF can also be used with personal sampling pumps when sampling for PAHs using the Lewis/McCloud method. Breakthrough of the more volatile PCBs and PAHs may occur when using PUF.

C Sampling Bags (Tedlar[®])

Sampling bags, like canisters, transport air samples to the laboratory for analysis. Samples are generally pumped into the bags, but sometimes a lung system is used, in which a pump creates a vacuum around the bag in a vacuum box. The sample flows from a source into the bag. This method is used for VOCs, fixed gases (CO₂, O₂, and N₂) and methane.

C Impingers

An impinger allows an air sample to be bubbled through a solution, which collects a specific contaminant by either chemical reaction or absorption. For long sampling periods, the impinger may need to be kept in an ice bath to prevent the solution from evaporating during sampling. The sample is drawn through the impinger by using a sampling pump or more elaborate sampling trains with multiple impingers.

C Sorbent Tubes/Cartridges

A variety of sampling media are available in sorbent tubes, which are used primarily for industrial hygiene. A few examples are carbon cartridges, carbon molecular sieves, Tenax tubes and tube containing the XAD-2 polymer. Depending upon the sorbent material, tubes can be analyzed using either a solvent extraction or thermal desorption. The former technique uses standard laboratory equipment and allows for multiple analyses of the same sample. The latter technique requires special, but readily available, laboratory equipment and allows only one analysis per sample. In addition, thermal desorption typically allows for lower detection limits by two or more orders of magnitude. Whenever sorbent tubes are

being used for thermal desorption, they should be certified as "clean" by the laboratory doing the analysis.

Thermally Desorbed Media

During thermal desorption, high-temperature gas streams are used to remove the compounds collected on a sorbent medium. The gas stream is injected and often cryofocused into an analytical instrument, such as a GC, for compound analysis:

C Tenax Tubes

Tenax tubes are made from commercially available polymer (p-phenylene oxide) packed in glass or stainless steel tubes through which air samples are drawn or sometimes pumped. These tubes are used in U.S. EPA Method TO1 and VOST for volatile nonpolar organic, some polar organic, and some of the more volatile semivolatile organics. Tenax is not appropriate for many of the highly volatile organics (with vapor pressure greater than approximately 200 mm Hg).

C Carbonized Polymers

The carbonized molecular sieve (CMS), a carbonized polymer, is a commercially available, carbon sorbent packed in stainless-steel sampling tubes through which air samples are drawn or sometimes pumped. These are used in U. S. EPA Method TO2 for highly volatile nonpolar compounds which have low-breakthrough volumes on other sorbents. When high-thermal desorption temperatures are used with CMS, more variability in analysis may occur than with other sorbents.

C Mixed Sorbent Tubes

Sorbent tubes can contain two types of sorbents. Combining the advantages of each sorbent into one tube increases the possible types of compounds to be sampled. The combination of two sorbents can also reduce the chance that highly volatile compounds will break through the sorbent media. An example of a mixed sorbent tube is the combination of Tenax and charcoal with a carbonized molecular sieve. A potential problem with mixed sorbent tubes is the breakthrough of a compound from an earlier sorbent to a later sorbent from which it

cannot be desorbed.

Solvent-Extracted Media

Solvent-extracted media use the principle of chemical extraction to remove compounds collected on a sorbent media. The chemical solvent is injected into an instrument, such as a GC, for analysis of compounds. Examples of solvent-extracted media follow:

C Chemically Treated Silica Gel

Silica gel is a sorbent which can be treated with various chemicals. The chemically treated silica gel can then be used to sample for specific compounds in air. Examples include the DNPH-coated silica gel cartridge used with U.S. EPA Method TO11.

C XAD-2 Polymers

XAD-2 polymers usually are placed in tubes, custom-packed sandwich-style with polyurethane foam, and prepared for use with U.S. EPA Method TO13 or the semi-VOST method. The polymers are used for the collection of semivolatile polar and nonpolar organic compounds. The compounds collected on the XAD-2 polymer are chemically extracted for analysis.

C Charcoal Cartridges

Charcoal cartridges, consisting of primary and backup sections, trap compounds by adsorption. Ambient air is drawn through them so that the backup section verifies that breakthrough of the analytes on the first section did not occur, and the sample collection was therefore quantitative. Quantitative sample collection is evident by the presence of target chemicals on the first charcoal section and the absence on the second section. Next, the adsorbed compounds must be eluted, usually with a solvent extraction, and analyzed by GC with a detector, such as a Mass Spectrometer (MS).

C Tenax Tubes

Cartridges are used in OSHA and NIOSH methods in a manner similar to charcoal cartridges but typically for less volatile

compounds.

Particulate Filters

Particulate filters are used by having a sampling pump pass air through them. The filter collects the particulates present in the air and is then analyzed for particulate mass or chemical or radiological composition. Particulate filters are made from different materials which are described below.

C Mixed Cellulose Ester (MCE)

MCE is manufactured from mixed esters of cellulose which are a blend of nitro-cellulose and cellulose acetate. MCE filters are used often for particulate sampling.

C Glass Fiber

Glass fiber is manufactured from glass fibers without a binder. Particulate filters with glass fiber provide high flow rates, wet strength, and high, solid holding capacity. Generally, the filters are used for gravimetric analysis of particulates.

C Polyvinyl Chloride

Particulate filters with polyvinyl chloride are resistant to concentrated acids and alkalis. Their low moisture pickup and light tare weight make them ideal for gravimetric analysis.

C Teflon

Teflon is manufactured from polytetrafluorethylene (PTFE). Particulate filters with Teflon are easy to handle and exceptionally durable. Teflon filters are used for metal collection.

C Silver

Particulate filters manufactured from pure silver have high collection efficiency and uniform pore size. These filters are used for mercury collection and analysis.

C Cellulose

Particulate filters with cellulose contain less

than 0.01% ash. These filters are used to collect particulates.

Standard Operating Procedure

A-

For

The Collection of Airborne Particulate to Determine Fiber Content

Purpose / Scope

The purpose of this Standard Operating Procedure (SOP) is to provide a basic procedure for the collection of airborne particulate to determine airborne fiber content.

These Standard Operating Procedures, which may be varied or changed as required, are dependent upon on-site conditions, equipment limitations imposed by the procedure or other procedure limitations. In all instances, the sampling procedures employed should be documented and associated with the final report.

Page: 1 of 3

Authored By: _____ Date: _____

Validated By: _____ Date: _____

Approved By: _____ Date: _____

Paul S. Chopra
Laboratory Manager



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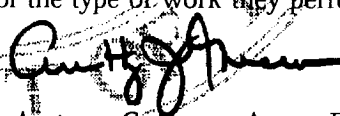
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Duly Authorized Representative: **PAUL S. CHOPRA**

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.


Anthony Germano, Acting Director
FOR THE COMMISSIONER OF LABOR



STATE OF NEW YORK DEPARTMENT OF HEALTH

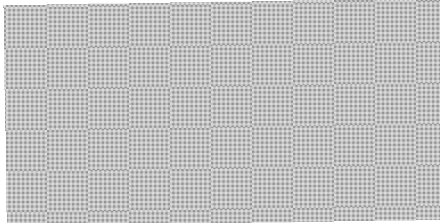
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Antonia C. Novello, M.D., M.P.H., Dr.P.H.
Commissioner

Dennis P. Whalen
Executive Deputy Commissioner

LAB ID: 10954

November 20, 2003



Certificate Expiration April 01, 2004
Date:

Dear Mr. Chopra,

Enclosed are the ELAP and/or NELAP Certificate(s) of Approval issued to your environmental laboratory for the current permit year. The Certificate(s) supersede any previously issued and are in effect through the expiration date listed above. Please carefully examine the Certificate(s) to insure that the categories, subcategories, analytes and methods for which your laboratory is approved are listed correctly, as well as verifying your laboratory's name, address, lead technical director and identification number.

Pursuant to regulation (Part 55-2 NYCRR), original certificates must be posted conspicuously in the laboratory and shall, upon request, be made available to any client of the laboratory. Certificates remain the property of the New York State Department of Health and must be surrendered promptly on demand.

Please note, pursuant to Section 55-2.5(a) NYCRR, any misrepresentation of the Fields of Accreditation (Matrix - Method - Analyte) for which your laboratory is approved may result in denial, suspension, or revocation of your certification. Any use of the ELAP or NELAP name, reference to the laboratory's approval status and/or using the NELAC/NELAP logo in any catalogs, advertising, business solicitations, proposals, quotations, laboratory analytical reports or other materials must include the laboratory's ELAP identification number, and must distinguish between proposed testing for which the laboratory is approved and the proposed testing for which the laboratory is not approved.

The National Environmental Laboratory Accreditation Conference (NELAC) further defines and limits the use of NELAP accreditation and the NELAP logo.

Please notify the ELAP office of any changes you feel need to be made to your Certificate(s). We may be reached via email to elap@health.state.ny.us or by calling (518) 485-5570.

Sincerely,

Joyce Reilly

Administrative Assistant
Environmental Laboratory
Approval Program

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

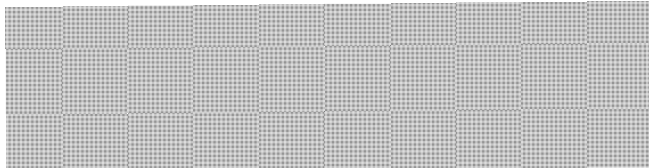
Antonia C. Novello, M.d., M.p.h., Dr.p.h.



Expires 12:01 AM April 01, 2004
Issued July 02, 2003
Revised November 20, 2003

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State



NY Lab Id No: 10954
EPA Lab Code: NY01442

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES POTABLE WATER
All approved subcategories and/or analytes are listed below:

Drinking Water Metals I

Arsenic, Total	EPA 200.7
Barium, Total	EPA 200.7
Cadmium, Total	EPA 200.7
Chromium, Total	EPA 200.7
Copper, Total	EPA 200.7
Iron, Total	EPA 200.7
Manganese, Total	EPA 200.7
Mercury, Total	EPA 245.1
Selenium, Total	EPA 200.9
Silver, Total	EPA 200.7
Zinc, Total	EPA 200.7

Drinking Water Non-Metals

Cyanide	SM 18-20 4500-CN E
Fluoride, Total	EPA 300.0
Hydrogen Ion (pH)	EPA 150.1
Nitrate (as N)	EPA 300.0
Nitrite (as N)	SM 18-20 4500 NO2 B
Silica, Dissolved	EPA 200.7
Solids, Total Dissolved	SM 18-20 2540C
Specific Conductance	SM 18-20 2510B
Sulfate (as SO ₄)	EPA 300.0

Drinking Water Metals II

Beryllium, Total	EPA 200.7
Nickel, Total	EPA 200.7
Thallium, Total	EPA 200.9

Drinking Water Non-Metals

Alkalinity	SM 18-20 2320-B
Calcium Hardness	EPA 200.7
Chloride	EPA 300.0
Color	SM 18-20 2120B
Corrosivity	SM 18-19 2330

Serial No.: 20934

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To be conspicuously posted. Valid certificates have a raised seal and may be
verified by calling (518) 485-5570.

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Antonia C. Novello, M.d., M.p.h., Dr.p.h.



Expires 12:01 AM April 01, 2004
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Revised November 20, 2003

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Issued in accordance with and pursuant to section 502 Public Health Law of New York State

NY Lab Id No: 10954
EPA Lab Code: NY01442

*is hereby APPROVED as an Environmental Laboratory in conformance with the
National Environmental Laboratory Accreditation Conference Standards for the category
ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved analytes are listed below:*

Acrolein and Acrylonitrile

Acrolein	EPA 624
Acrylonitrile	EPA 624

Demand

Chemical Oxygen Demand	EPA 410.4
------------------------	-----------

Nutrient

Phosphorus, Total	EPA 365.2
-------------------	-----------

Wastewater Miscellaneous

Boron, Total	EPA 200.7
Bromide	EPA 300.0
Organic Carbon, Total	EPA 415.1
Phenols	EPA 420.1
Silica, Dissolved	EPA 200.2
	EPA 200.7
Surfactant (MBAS)	EPA 425.1

Serial No.: 20935

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DOH-3317 (3/97)



NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Antonia C. Novello, M.d., M.p.h., Dr.p.h.



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CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 500 Public Health Law of New York State

NY Lab Id No: 10954

EPA Lab Code: NY01442

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved subcategories and/or analytes are listed below:

Chlorinated Hydrocarbon Pesticides

4,4 -DDE	EPA 608
4,4 -DDT	EPA 608
4,4-DDD	EPA 608
Aldrin	EPA 608
alpha-BHC	EPA 608
gamma-BHC	EPA 608
lone Total	EPA 608
delta-BHC	EPA 608
Dieldrin	EPA 608
Endosulfan I	EPA 608
Endosulfan II	EPA 608
Endosulfan sulfate	EPA 608
Endrin	EPA 608
Endrin aldehyde	EPA 608
Heptachlor	EPA 608
Heptachlor epoxide	EPA 608
Lindane	EPA 608
Toxaphene	EPA 608

Chlorinated Hydrocarbons

1,2,4-Trichlorobenzene	EPA 625
2-Chloronaphthalene	EPA 625
Hexachlorobenzene	EPA 625
Hexachlorobutadiene	EPA 625

Chlorinated Hydrocarbons

Hexachlorocyclopentadiene	EPA 625
Hexachloroethane	EPA 625
Mineral	
Acidity	EPA 305.1
Alkalinity	EPA 310.1
Calcium Hardness	EPA 130.2
Chloride	EPA 300.0
	SM 18-20 4500-Cl B
Fluoride, Total	EPA 300.0

	EPA 340.2
Hardness, Total	EPA 130.2
Sulfate (as SO ₄)	EPA 300.0
	EPA 375.4

Nitroaromatics and Isophorone

2,4-Dinitrotoluene	EPA 625
2,6-Dinitrotoluene	EPA 625
Isophorone	EPA 625
Nitrobenzene	EPA 625

Nutrient

Ammonia (as N)	EPA 350.3
Nitrate (as N)	EPA 352.1
Nitrite (as N)	EPA 354.1

Serial No.: 20936

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NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Antonia C. Novello, M.d., M.p.h., Dr.p.h.



Expires 12:01 AM April 01, 2004
Issued July 02, 2003
Revised November 20, 2003

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

NY Lab Id No: 10954
EPA Lab Code: NY01442

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES NON POTABLE WATER
All approved subcategories and/or analytes are listed below:

Nutrient

Orthophosphate (as P)	EPA 300.0
	EPA 365.2

Polychlorinated Biphenyls

PCB-1016	EPA 608
PCB-1221	EPA 608
1232	EPA 608
1242	EPA 608
PCB-1248	EPA 608
PCB-1254	EPA 608
PCB-1260	EPA 608

Polynuclear Aromatics

Acenaphthene	EPA 625
Acenaphthylene	EPA 625
Anthracene	EPA 625
Benzo(a)anthracene	EPA 625
Benzo(a)pyrene	EPA 625
Benzo(b)fluoranthene	EPA 625
Benzo(ghi)perylene	EPA 625
Benzo(k)fluoranthene	EPA 625
Chrysene	EPA 625
Dibenzo(a,h)anthracene	EPA 625
Fluoranthene	EPA 625

Polynuclear Aromatics

Fluorene	EPA 625
Indeno(1,2,3-cd)pyrene	EPA 625
Naphthalene	EPA 625
Phenanthrene	EPA 625
Pyrene	EPA 625

Priority Pollutant Phenols

2,4,5-Trichlorophenol	EPA 625
2,4,6-Trichlorophenol	EPA 625
2,4-Dichlorophenol	EPA 625
2,4-Dimethylphenol	EPA 625
2,4-Dinitrophenol	EPA 625
2-Chlorophenol	EPA 625
2-Methyl-4,6-dinitrophenol	EPA 625
2-Nitrophenol	EPA 625
4-Chloro-3-methylphenol	EPA 625
4-Nitrophenol	EPA 625
Pentachlorophenol	EPA 625
Phenol	EPA 625

Purgeable Aromatics

1,2-Dichlorobenzene	EPA 624
1,3-Dichlorobenzene	EPA 624
1,4-Dichlorobenzene	EPA 624

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DOH-3317 (3/97)

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ENVIRONMENTAL ANALYSES NON POTABLE WATER
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Purgeable Aromatics

Benzene	EPA 624
Chlorobenzene	EPA 624
Ethyl benzene	EPA 624
Toluene	EPA 624
o-Xylenes	EPA 624

Purgeable Halocarbons

1,1,1-Trichloroethane	EPA 624
1,1,2,2-Tetrachloroethane	EPA 624
1,1,2-Trichloroethane	EPA 624
1,1-Dichloroethane	EPA 624
1,1-Dichloroethene	EPA 624
1,2-Dichloroethane	EPA 624
1,2-Dichloropropane	EPA 624
2-Chloroethylvinyl ether	EPA 624
Bromodichloromethane	EPA 624
Bromoform	EPA 624
Bromomethane	EPA 624
Carbon tetrachloride	EPA 624
Chloroethane	EPA 624
Chloroform	EPA 624
Chloromethane	EPA 624
cis-1,3-Dichloropropene	EPA 624
Dibromochloromethane	EPA 624

Purgeable Halocarbons

Dichlorodifluoromethane	EPA 624
Methylene chloride	EPA 624
Tetrachloroethene	EPA 624
trans-1,2-Dichloroethene	EPA 624
trans-1,3-Dichloropropene	EPA 624
Trichloroethene	EPA 624
Trichlorofluoromethane	EPA 624
Vinyl chloride	EPA 624

Residue

Solids, Total	EPA 160.3
Solids, Total Dissolved	EPA 160.1
Solids, Total Suspended	EPA 160.2

TCLP Additional Compounds

Cresol	SW-846 8270C
Methylethyl ketone (2-butanone)	SW-846 8260B
Pyridine	SW-846 8270C

Wastewater Metals I

Barium, Total	EPA 200.7
Cadmium, Total	EPA 200.7
Calcium, Total	EPA 200.7
Chromium, Total	EPA 200.7
Copper, Total	EPA 200.7

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All approved subcategories and/or analytes are listed below:

Wastewater Metals I

Iron, Total	EPA 200.7
Lead, Total	EPA 200.7
Magnesium, Total	EPA 200.7
Manganese, Total	EPA 200.7
Copper, Total	EPA 200.7
Potassium, Total	EPA 200.7
Silver, Total	EPA 200.7

Wastewater Miscellaneous

Cyanide, Total	EPA 335.2
Hydrogen Ion (pH)	EPA 150.1
Oil & Grease Total Recoverable	EPA 1664-A
Specific Conductance	EPA 120.1
Sulfide (as S)	EPA 376.1
Temperature	EPA 170.1

Wastewater Metals II

Aluminum, Total	EPA 200.7
Antimony, Total	EPA 200.7
Arsenic, Total	EPA 200.7
Chromium VI	SM 18-19 3500-Cr D
Mercury, Total	EPA 245.1 SW-846 7470A
Selenium, Total	EPA 200.7
Zinc, Total	EPA 200.7

Wastewater Metals III

Cobalt, Total	EPA 200.7
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Wastewater Miscellaneous

Color	EPA 110.1
Corrosivity	SM 18-19 2330
Cyanide, Total	EPA 335.1

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**NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER**

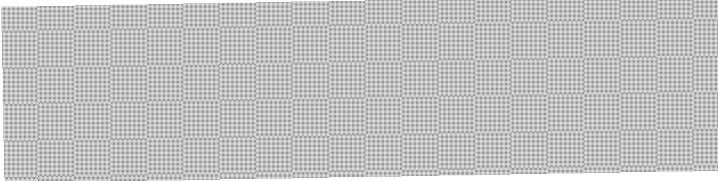
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National Environmental Laboratory Accreditation Conference Standards for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE*

All approved analytes are listed below:

Characteristic Testing

TCLP

FED REG 1311

Serial No.: 20937

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DOH-3317 (3/97)



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ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:

Acrolein and Acrylonitrile

Acrolein	SW-846 8260B
Acrylonitrile	SW-846 8260B

Characteristic Testing

Corrosivity	SW-846 1110
Irritability	SW-846 1010
Toxicity	SW-846 Ch7, Sec. 7.3

Chlorinated Hydrocarbon Pesticides

4,4'-DDE	SW-846 8081A
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Chlorinated Hydrocarbons

1,2,4-Trichlorobenzene	SW-846 8270C
2-Chloronaphthalene	SW-846 8270C
Hexachlorobenzene	SW-846 8270C
Hexachlorobutadiene	SW-846 8270C
Hexachlorocyclopentadiene	SW-846 8270C
Hexachloroethane	SW-846 8270C

Metals I

Barium, Total	SW-846 6010B
Cadmium, Total	SW-846 6010B
Chromium, Total	SW-846 6010B
Lead, Total	SW-846 6010B
	SW-846 7420

Metals I

Nickel, Total	SW-846 6010B
Silver, Total	SW-846 6010B

Metals II

Antimony, Total	SW-846 6010B
Arsenic, Total	SW-846 6010B
Chromium VI	SW-846 7196A
Mercury, Total	SW-846 7471A
Selenium, Total	SW-846 6010B

Miscellaneous

Asbestos in Friable Material	EPA 600/M4/82/020
Cyanide, Total	SW-846 9010B
Lead in Paint	SW-846 7420
Sulfide (as S)	SW-846 9030B

Nitroaromatics and Isophorone

2,4-Dinitrotoluene	SW-846 8270C
2,6-Dinitrotoluene	SW-846 8270C
Isophorone	SW-846 8270C
Nitrobenzene	SW-846 8270C

Polychlorinated Biphenyls

PCB-1016	SW-846 8082
PCB-1221	SW-846 8082

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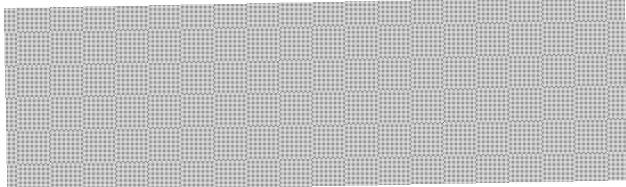
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Polychlorinated Biphenyls

PCB-1232	SW-846 8082
PCB-1242	SW-846 8082
PCB-1248	SW-846 8082
PCB-1254	SW-846 8082
PCB-1260	SW-846 8082

Polycyclic Aromatic Hydrocarbons

Acenaphthene	SW-846 8270C
Acenaphthylene	SW-846 8270C
Anthracene	SW-846 8270C
Benzo(a)anthracene	SW-846 8270C
Benzo(a)pyrene	SW-846 8270C
Benzo(b)fluoranthene	SW-846 8270C
Benzo(ghi)perylene	SW-846 8270C
Chrysene	SW-846 8270C
Dibenzo(a,h)anthracene	SW-846 8270C
Fluoranthene	SW-846 8270C
Fluorene	SW-846 8270C
Indeno(1,2,3-cd)pyrene	SW-846 8270C
Naphthalene	SW-846 8270C
Phenanthrene	SW-846 8270C
Pyrene	SW-846 8270C

Priority Pollutant Phenols

2,4,6-Trichlorophenol	SW-846 8270C
2,4-Dichlorophenol	SW-846 8270C
2,4-Dimethylphenol	SW-846 8270C
2,4-Dinitrophenol	SW-846 8270C
2-Chlorophenol	SW-846 8270C
2-Methyl-4,6-dinitrophenol	SW-846 8270C
2-Nitrophenol	SW-846 8270C
4-Chloro-3-methylphenol	SW-846 8270C
4-Nitrophenol	SW-846 8270C
Pentachlorophenol	SW-846 8270C
Phenol	SW-846 8270C

Purgeable Aromatics

1,2-Dichlorobenzene	SW-846 8260B
1,3-Dichlorobenzene	SW-846 8260B
1,4-Dichlorobenzene	SW-846 8260B
Benzene	SW-846 8260B
Chlorobenzene	SW-846 8260B
Ethyl benzene	SW-846 8260B
Toluene	SW-846 8260B
Total Xylenes	SW-846 8260B

Purgeable Halocarbons

1,1,1-Trichloroethane	SW-846 8260B
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Polychlorinated Biphenyls

PCB-1232	SW-846 8082
PCB-1242	SW-846 8082
PCB-1248	SW-846 8082
PCB-1254	SW-846 8082
PCB-1260	SW-846 8082

Nuclear Aromatic Hydrocarbons

Acenaphthene	SW-846 8270C
Acenaphthylene	SW-846 8270C
Anthracene	SW-846 8270C
Benzo(a)anthracene	SW-846 8270C
Benzo(a)pyrene	SW-846 8270C
Benzo(b)fluoranthene	SW-846 8270C
Benzo(ghi)perylene	SW-846 8270C
Chrysene	SW-846 8270C
Dibenzo(a,h)anthracene	SW-846 8270C
Fluoranthene	SW-846 8270C
Fluorene	SW-846 8270C
Indeno(1,2,3-cd)pyrene	SW-846 8270C
Naphthalene	SW-846 8270C
Phenanthrene	SW-846 8270C
Pyrene	SW-846 8270C

Priority Pollutant Phenols

2,4,6-Trichlorophenol	SW-846 8270C
2,4-Dichlorophenol	SW-846 8270C
2,4-Dimethylphenol	SW-846 8270C
2,4-Dinitrophenol	SW-846 8270C
2-Chlorophenol	SW-846 8270C
2-Methyl-4,6-dinitrophenol	SW-846 8270C
2-Nitrophenol	SW-846 8270C
4-Chloro-3-methylphenol	SW-846 8270C
4-Nitrophenol	SW-846 8270C
Pentachlorophenol	SW-846 8270C
Phenol	SW-846 8270C

Purgeable Aromatics

1,2-Dichlorobenzene	SW-846 8260B
1,3-Dichlorobenzene	SW-846 8260B
1,4-Dichlorobenzene	SW-846 8260B
Benzene	SW-846 8260B
Chlorobenzene	SW-846 8260B
Ethyl benzene	SW-846 8260B
Toluene	SW-846 8260B
Total Xylenes	SW-846 8260B

Purgeable Halocarbons

1,1,1-Trichloroethane	SW-846 8260B
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1,1,2,2-Tetrachloroethane	SW-846 8260B
1,1,2-Trichloroethane	SW-846 8260B
1,1-Dichloroethane	SW-846 8260B
1,1-Dichloroethene	SW-846 8260B
1,2-Dichloroethane	SW-846 8260B
1,2-Dichloropropane	SW-846 8260B
1,2-Dichlorovinyl ether	SW-846 8260B
Bromodichloromethane	SW-846 8260B
Bromoform	SW-846 8260B
Bromomethane	SW-846 8260B
Carbon tetrachloride	SW-846 8260B
Chloroethane	SW-846 8260B
Chloroform	SW-846 8260B
Chloromethane	SW-846 8260B
cis-1,3-Dichloropropene	SW-846 8260B
Dibromochloromethane	SW-846 8260B
Dichlorodifluoromethane	SW-846 8260B
Methylene chloride	SW-846 8260B
Tetrachloroethene	SW-846 8260B
trans-1,3-Dichloropropene	SW-846 8260B
Trichloroethene	SW-846 8260B
Trichlorofluoromethane	SW-846 8260B
Vinyl chloride	SW-846 8260B

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WADSWORTH CENTER**

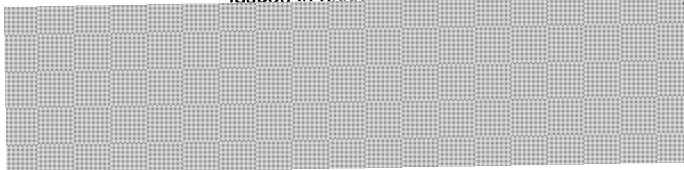
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ENVIRONMENTAL ANALYSES AIR AND EMISSIONS
All approved analytes are listed below:*

Miscellaneous Air

Particulates

40 CFR PART 50 1984 APP B

Serial No.: 20939

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DOH-3317 (3/97)



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ENVIRONMENTAL ANALYSES AIR AND EMISSIONS
All approved subcategories and/or analytes are listed below:*

Metals I

Lead, Total SM 15 303A

Miscellaneous Air

Fibers 40 CFR 763.121 APX B

Serial No.: 20940

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verified by calling (518) 485-5570.



Statement of Qualifications

Scott Hammond

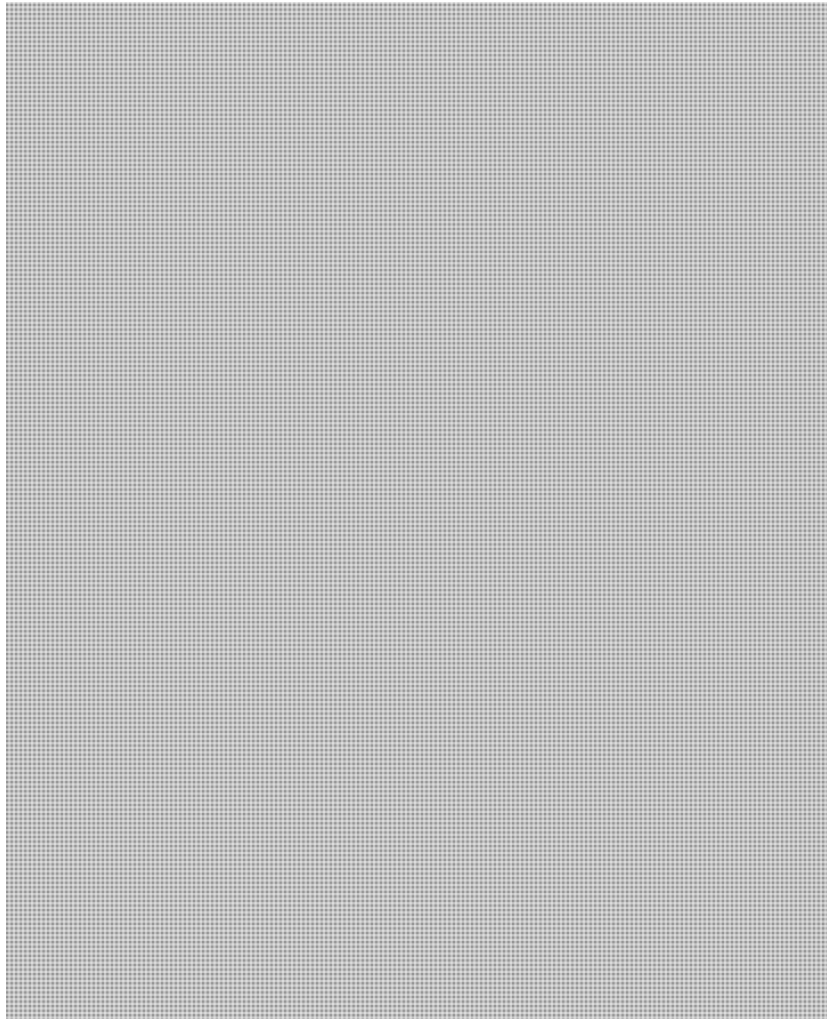
Project Manager

Mr. Hammond currently performs and or oversees variety of tasks including building surveys and assessments for asbestos, lead, and other hazardous materials, over-site of projects during asbestos abatement, and sampling and health & safety over-site during surface preparation projects on steel structures. Mr. Hammond has been with Chopra-Lee, Inc. since 1995.

Education: AAS Erie County Community College, Construction Technology

Professional Training

- SSPC C-3 Training – Supervisor/Competent Person for Deleading of Industrial Structure
- NYS Asbestos Air Sampling Technician
- NYS/EPA Asbestos Inspector
- NYS Asbestos Project Monitor
- NITON XRF Training
- EPA 40 hr. Haz-Waste Training
- Radiation II Worker Training
- First Aid/CPR Training
- Lead-Supervisor-Competent Person Training



New York State Department of Health Certificate of Asbestos Safety Training
This certificate is the only documentation acceptable for purposes of
interstate reciprocity among the Consortium of Northeast States.

Certificate No. **395039**

I - To be completed by trainee

Name of trainee (print):

N

A

(S

S

The Safety and Health Center

Telephone Number: (716) 838-6850

Address: 2495 MAIN ST Suite 426

Zip Code: 14214

Buffalo, NY

Course Location: Time

Course Title: Project Monitor Refresher

Language of Training: ☒ English ☐ Other: _____ Exam Grade: 92%

Dates of Training: From: 11/6/03 To: 11/6/03 Expires: 11/6/04

I certify that the asbestos safety training course given on the above date complied with both 10NYCRR Part 73 and TSCA Title II, was consistent with the curriculum and instructors approved by the New York State Department of Health, and the student receiving this certificate completed the training course and successfully passed the examination.

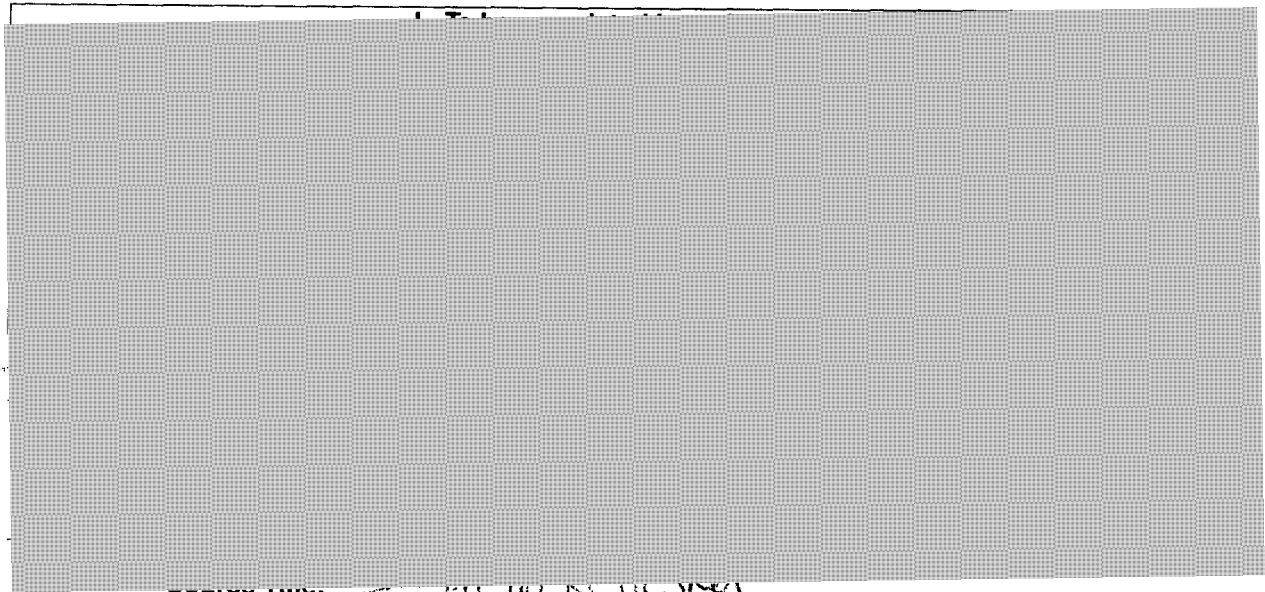
Course Director: Raymond Z. Turpin
(Printed)

Raymond Z. Turpin
(Signature) **STUDENT**

DOH-2832 (7/98)

New York State Department of Health Certificate of Asbestos Safety Training
This certificate is the only documentation acceptable for purposes of
interstate reciprocity among the Consortium of Northeast States.

Certificate No. **397449**



Language of Training: ☒ English ☐ Other: _____ Exam Grade: 96%

Dates of Training: From: 11/5/03 To: 11/5/03 Expires: 11/5/04

I certify that the asbestos safety training course given on the above date complied with both 10NYCRR Part 73 and TSCA Title II, was consistent with the curriculum and instructors approved by the New York State Department of Health, and the student receiving this certificate completed the training course and successfully passed the examination.

Course Director: Raymond Z. Turpin
(Printed)

Raymond Z. Turpin
(Signature) **STUDENT**

DOH-2832 (7/98)

Chopra-Lee, Inc.

1815 Love Road, Grand Island, New York 14072 716-773-7625

certifies that

Scott Hammond


has satisfactorily completed the course entitled

Hazardous Waste Site Worker Refresher

for the purpose of meeting the requirement of OSHA 29 CFR 1910.120(e)(8).

Course Date: January 8&9, 2003
Expiration Date: January 9, 2004

Training Location: Grand Island
Certificate Number: 20030109-03


Instructor


Dir. of Training

Safety Risk Management Consultants, Inc.

1741 Baseline Road, Grand Island, NY 14072 (716) 773-9192

This is to certify that the below named individual has successfully
completed the course entitled

40 HOUR HAZARDOUS WASTE SITE WORKER

for purposes of meeting the requirement of
OSHA 29 CFR 1910.120

Name Scott Hammond

Dated the 27th day of February, 19 94

Social Security No. 133-68-6472

Director of Training 

Course Duration: 40 Hours

President 



This certifies that on July 14, 1998

Scott Hammond

Attended and successfully completed
Radiation Worker Training Program
meeting the requirements of 10 CFR20.

Issue Date: 7-14-98

Expiration Date: 7-14-00

Jon Showers
Instructor

A handwritten signature in black ink, appearing to read "Jon Showers", written over a horizontal line.

Jennifer Brown, CIH, CSP
HSO/RSO Linde Bldg. 30 Project

A handwritten signature in black ink, appearing to read "Jennifer Brown", written over a horizontal line.

COMPREHENSIVE OCCUPATIONAL MEDICAL SERVICES, P.C.
Gordon C. Steinagle, D.O., M.P.H.

FIT FOR DUTY STATEMENT

NAME: SCOTT Hammond SS#: [REDACTED]
DATE OF EXAM: 1/14/03 PHYSICIAN: GORDON C. STEINAGLE, D.O., M.P.H.
EMPLOYER: Chopra Lee

TYPE OF EXAM:

☒ ASBESTOS SCREENING (1910.1001)
☐ AUDIOLOGY EVALUATION (1910.95)
☐ HAZWOPER (1910.120)
☒ LEAD SURVEILLANCE (1910.1025)
☒ RESPIRATOR CLEARANCE (1910.134)
☐ RETURN TO WORK
☐ OTHER: _____

☒ The above named individual was found to be:
☒ Fit for Duty as per the above standard(s).
☐ Not Fit for Duty as per the above standard(s).

☒ Needs annual asbestos exam and chest x-ray.
☒ The above named individual has been informed of the synergistic effect of smoking and asbestos exposure in causing lung cancer.
☐ The above named individual was advised of the need for an annual _____ exam and _____.

Comments:

[Signature]
GORDON C. STEINAGLE, D.O., M.P.H.

1/16/03
DATE



Statement of Qualifications

Louis Giardina

Senior Technician

Mr. Giardina has been in the environmental health and safety business over 7 years and has extensive knowledge of hazardous materials abatement projects. He currently performs a variety of health and safety audits, environmental sampling and inspections for asbestos, lead, and other hazardous materials throughout Western New York and the Eastern U.S. Mr. Giardina has been with Chopra-Lee, Inc. since 1999.

Education: Community College of the Air Force - Electrical & Mechanical Technology
US Air Force - Total Quality Management

Professional Training

- SSPC C-3 Training – Supervisor/Competent Person for Deleading of Industrial Structure
- NYS Asbestos Air Sampling Technician
- NYS Asbestos Contractor / Supervisor Training
- OSHA 40 hr. Haz Waste Training
- OSHA 510 Training
- Confined Space Training
- Red Cross First Aid / CPR
- Evacuation and Trenching

I - To be completed by trainee

Name of trainee (print):

LOUIS GIARDINA

Name of trainee (signature):

[Signature]

Social Security Number:

[Redacted]

II - To be completed by training sponsor

Sponsor's Name:

The Safety and Health Center

Telephone Number:

[Redacted]

Address:

[Redacted]

Zip Code:

14214

Course Location:

Same

Course Title: Project Monitor Refresher

Language of Training: ☒ English ☐ Other: _____ Exam Grade: 96%

Dates of Training: From: 11/6/03 To: 11/6/03 Expires: 11/6/04

I certify that the asbestos safety training course given on the above date complied with both 10NYCRR Part 73 and TSCA Title II, was consistent with the curriculum and instructors approved by the New York State Department of Health, and the student receiving this certificate completed the training course and successfully passed the examination.

Course Director: Raymond Z. Turpin

(Printed)

[Signature]
(Signature) **STUDENT**

DOH-2832 (7/98)

I - To be completed by trainee

Name of trainee (print):

LOUIS GIARDINA

Name of trainee (signature):

[Signature]

Address:

[Redacted]

Sponsor's Name:

The Safety and Health Center

Telephone Number:

[Redacted]

Address:

[Redacted]

Zip Code:

14214

Course Location:

Same

Course Title: Inspector Refresher

Language of Training: ☒ English ☐ Other: _____ Exam Grade: 88%

Dates of Training: From: 11/5/03 To: 11/5/03 Expires: 11/5/04

I certify that the asbestos safety training course given on the above date complied with both 10NYCRR Part 73 and TSCA Title II, was consistent with the curriculum and instructors approved by the New York State Department of Health, and the student receiving this certificate completed the training course and successfully passed the examination.

Course Director: Raymond Z. Turpin

(Printed)

[Signature]
(Signature) **STUDENT**

DOH-2832 (7/98)

Chopra-Lee, Inc.

1815 Love Road, Grand Island, New York 14072 716-773-7625

certifies that

Lou Giardina

has satisfactorily completed the course entitled

Hazardous Waste Site Worker Refresher

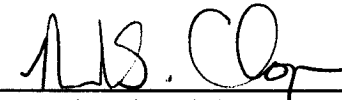
for the purpose of meeting the requirement of OSHA 29 CFR 1910.120(e)(8).

Course Date: January 8&9, 2003
Expiration Date: January 9, 2004

Training Location: Grand Island
Certificate Number: 20030109-02



Instructor



Dir. of Training

Certificate of Completion

May it be known that this certificate
has been presented to

Louis Giardina

for completion of

***Hazardous Waste Operations
and Emergency Response***

**40 Hour Certification Training
29 CFR 1910.120(e)(3)(i)**

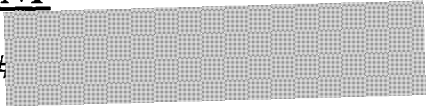
Charles W. Edelberger
Instructor

January 9, 1998


Compliance Management, Inc.

COMPREHENSIVE OCCUPATIONAL MEDICAL SERVICES, P.C.
Gordon C. Steinagle, D.O., M.P.H.

FIT FOR DUTY STATEMENT

NAME: LOU Giardina SS# 

DATE OF EXAM: 1/14/03 PHYSICIAN: GORDON C. STEINAGLE, D.O., M.P.H.

EMPLOYER: Chopra Lee

TYPE OF EXAM:

☒ ASBESTOS SCREENING (1910.1001)

☐ AUDIOLOGY EVALUATION (1910.95)

☐ HAZWOPER (1910.120)

☒ LEAD SURVEILLANCE (1910.1025)

☒ RESPIRATOR CLEARANCE (1910.134)

☐ RETURN TO WORK

☐ OTHER: _____

☒ The above named individual was found to be:

☒ Fit for Duty as per the above standard(s).

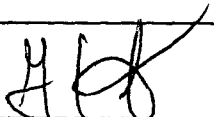
☐ Not Fit for Duty as per the above standard(s).

☒ Needs annual asbestos exam and chest x-ray.

☒ The above named individual has been informed of the synergistic effect of smoking and asbestos exposure in causing lung cancer.

☐ The above named individual was advised of the need for an annual _____ exam and _____.

Comments:


GORDON C. STEINAGLE, D.O., M.P.H.

1/16/03
DATE



Statement of Qualifications

Derek Nizialek

Senior Technician

Mr. Nizialek has been in the environmental health and safety business over 4 years. He currently performs a variety of health and safety audits, environmental sampling and inspections for asbestos, lead, and other hazardous materials throughout Western New York and the Eastern U.S. Mr. Nizialek has been with Chopra-Lee, Inc. since 1997.

Professional Training

- SSPC C-3 Training – Supervisor/Competent Person for Deleading of Industrial Structure
- NYS Asbestos Air Sampling Technician
- OSHA 40 hr. Haz Waste Training
- Lead Awareness Training
- WNY Plant SHCN Training
- Red Cross First Aid / CPR

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE



DMV# 360237988
EYES BLU
HAIR BRO
HGT 5' 08"

IF FOUND RETURN TO:
NYS DOL - L&C UNIT
ROOM 161 BUILDING 12
STATE OFFICE CAMPUS
ALBANY NY 12240

New York State Department of Health Certificate of Asbestos Safety Training
This certificate is the only documentation acceptable for purposes of interstate reciprocity among the Consortium of Northeast States.

Certificate No. **393434**

I - To be completed by trainee

Name of trainee (print):

DEREK A. NIZIALEK

Social Security Number:

Name of trainee (signature):

[Signature]

Address:

(Street or

II - To be completed by training sponsor

Sponsor's Name:

The Safety and Health Center

Telephone Number:

Address:

Zip Code:

14214

Course Location:

Jame

Course Title: Air Sampling Technician Refresher

Language of Training: ☒ English ☐ Other: _____ Exam Grade: 8496

Dates of Training: From: 9/5/03 To: 9/5/03 Expires: 9/5/04

I certify that the asbestos safety training course given on the above date complied with both 10NYCRR Part 73 and TSCA Title II, was consistent with the curriculum and instructors approved by the New York State Department of Health, and the student receiving this certificate completed the training course and successfully passed the examination.

Course Director:

Raymond Z. Turpin

(Printed)

[Signature]

(Signature)

STUDENT



Envotech

Center For Environmental Vocational Training
1250 Scottsville Road · Rochester, NY · 14611 · (716) 783-1465

This is to certify that

DEREK NIZIALEH

075-72-5761

has successfully completed all classroom, hands-on and examination requirements for the:
40 HOUR HAZARDOUS WASTE INITIAL COURSE 29 CFR 1910.120
For purpose of accreditation required by the Occupational Safety and Health Administration.

Certificate: 02012417

Instructor: Jim Sorel

Dates of Attendance: January 21-24, 2002

Issue Date: January 24, 2002

Exam Grade & Date: 98% ~ 01/24/02

Expiration Date: January 24, 2003

Course Director:

Barlene L. Graham, Res.

Chopra-Lee, Inc.

1815 Love Road, Grand Island, New York 14072 716-773-7625

certifies that

Derek Nizialek

has satisfactorily completed the course entitled

Hazardous Waste Site Worker Refresher

for the purpose of meeting the requirement of OSHA 29 CFR 1910.120(e)(8).

Course Date: January 8&9, 2003
Expiration Date: January 9, 2004

Training Location: Grand Island
Certificate Number: 20030109-09

Instructor

Dir. of Training

COMPREHENSIVE OCCUPATIONAL MEDICAL SERVICES, P.C.
Gordon C. Steinagle, D.O., M.P.H.

FIT FOR DUTY STATEMENT

NAME: Niziatk, Derek SS#: [REDACTED]
DATE OF EXAM: 1/10/03 PHYSICIAN: GORDON C. STEINAGLE, D.O., M.P.H.
EMPLOYER: Chofra Lee

TYPE OF EXAM:

☒ ASBESTOS SCREENING (1910.1001)
☐ AUDIOLOGY EVALUATION (1910.95)
☐ HAZWOPER (1910.120)
☒ LEAD SURVEILLANCE (1910.1025)
☒ RESPIRATOR CLEARANCE (1910.134)
☐ RETURN TO WORK
☐ OTHER: _____

☒ The above named individual was found to be:

☒ **Fit for Duty** as per the above standard(s).

☐ **Not Fit for Duty** as per the above standard(s).

☒ Needs annual asbestos exam and chest x-ray.

☒ The above named individual has been informed of the synergistic effect of smoking and asbestos exposure in causing lung cancer.

☐ The above named individual was advised of the need for an annual _____ exam and _____.

Comments:

Gordon C. Steinagle, D.O., M.P.H.
GORDON C. STEINAGLE, D.O., M.P.H.

1/13/03
DATE

51 Webster Street • North Tonawanda, New York 14120
Phone: (716) 692-6541 • Fax: (716) 692-7091

CC MR Niziatk

APPENDIX K
PROJECT SCHEDULE

Frontier Insulation Contractors, Inc.
Schedule for Asbestos Abatement 1397 Pletcher Road
Lewiston, New York

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
FUNCTION																															
Mobilization	■																														
Get decontamination - system operational	■																														
Install tempoary lighting in work areas		■																													
Background sampling*	■																														
Pre abatement sampling*		■																													
Isolate work areas per regulations			■	■	■																										
Install HEPA filtered - negative air					■																										
Visual inspection of - contained work areas						■																									
Asbestos abatement							■	■	■																						
Area air sampling*							■	■	■	■																					
Final cleaning abatement - of abated areas									■																						
Final air clearance sampling*										■																					
Demobilize from site											■																				
* = Work performed by 3rd party air monitoring firm.																															