

# 1. SCOPE OF WORK

## PUT YOUR MATERIAL HERE

*A plumbing leak caused the microbial contamination in the entire building. The leak lasted a long time and proper drying methods were not conducted. This basement area has been wet from this leaks for two years. Ambassador Construction Consultants Inc. in conjunction with Forensic Imaging Inc. conducted three air surveys in three different building units in the first half of 2002 under the direction of the building owner, All three reports show significant mold spore contamination.*

Prior to any work full containment, critical barriers shall be placed over all openings, exterior doors and windows. Critical barriers shall consist of 6-mil polyethylene sheeting. A three stage decontamination unit shall be installed where the contractor feels will best serve his needs. The location of this unit should be reviewed by the consultant. AFD's Shall be installed in all units of this three unit building. (Garage is one unit, main house is one units, and one bedroom apartment is the third unit. Several other building s exist on this property and are not in the scope of this project. These buildings are not to be used for storage, or even entered into, due to possible cross contamination.) Negative pressure shall be installed and measured. Air scrubbers should be installed on all levels and in all sections of home during cleaning and remediation. Several de-humidifiers shall be used in the garage unit and set to 45% humidity. The discharge of the humidifiers shall be monitored. No fans are permitted that would potentially spread more mold spores. If fans are to be used the consultant shall be notified. **This entire system or systems shall be inspected by the consultant prior to cleaning and prior to work.**

Prior to cleaning the household units we recommend a preliminary step be taken due to the abundant amount of chattel, household items, collections, furniture, and etc. It would be advised to discard all unnecessary items or items that are no longer functional or obsolete. This would include cardboard boxes, paper, magazines, food in cardboard boxes, and any other item the owner feels is no longer functional. This will make the decontamination and storage less cumbersome. These items shall be placed in double 6-mil polyethylene bags. If large items cannot fit bags, then polyethelene sheeting shall be used. The large items shall be wrapped tight and taped prior to being discarded. The entire home contents shall follow the following cleaning flow chart.

### **Guidelines for Remediation Building Materials and stored household items with mold growth and contamination caused by clean water for the second story and third story living areas.**

Books and papers	3,	Full PPE	Full Containment
Carpeting and backing	1,3,4	Full PPE	Full Containment
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1,2,3	Full PPE	Full Containment
Concrete or cinder block	1,3	Full PPE	Full Containment
Non-porous hard surfaces (plastic, metals)	1,2,3	Full PPE	Full Containment
Wallboard (drywall and gypsum board)	3,4	Full PPE	Full Containment
Wood surfaces	1,2,3	Full PPE	Full Containment

Contained Collections (cars, stuff, ect in glass cabinets)	2,3	Full PPE	Full Containment
Upholstered furniture and drapes	1,3,4,	Full PPE	Full Containment

STEP ONE CAN BE OMITTED FOR THE SECOND AND THIRD FLOORS DUE TO AREAS BEING DRY AND NOT WET.

1. *If books and papers were contained and collections were contained in locked or closed cabinets skip the wet wipe phase (2). If the paper or books has visible mold growth they should be discarded.*
2. *If books and papers were not contained and collections were not contained or not locked in cabinets wet wipe phase (2) should not be skipped. If the possibility of the object being ruined the owner shall be notified. The contractor is ultimately responsible for any damage that occurs during the cleaning phase.*
3. *Throw out all upholstered furniture, drapes, mattresses unless the contractor feels he can properly clean this units. It will be less expensive to discard rather than to properly clean these objects.*
4. *The contractor shall make a list of all items to be discarded and have the owner sign off prior to discarding. The contractor should also consider taking digital photos of video of cleaning process.*

**Guidelines for Remediation Building Materials and stored household items with mold growth and contamination caused by clean water for the second story and third story living areas.**

Books and papers	2,3,or 4,	Full PPE	Full Containment
Carpeting and backing	1,3,4	Full PPE	Full Containment
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1,2,3,4,	Full PPE	Full Containment
Concrete or cinder block	1,3	Full PPE	Full Containment
Non-porous hard surfaces (plastic, metals)	1,2,3	Full PPE	Full Containment
Wallboard (drywall and gypsum board)	3,4	Full PPE	Full Containment
Wood surfaces	1,2,3,4	Full PPE	Full Containment
Contained Collections (cars, stuff, ect in glass cabinets)	2,3,or 4,	Full PPE	
Upholstered furniture and drapes	1,3,4,	Full PPE	Full Containment
Car parts, motors, etc	1,2,3 or 4	Full PPE	Full Containment
Cardboard boxes or anything	4	Full PPE	Full Containment

**Method 1: WET VACUUM ( in the case of poro us material, some mold spores / fragments will remain in the material but will not grow if the material is completely dried ). Steam cleaning may be an alternative for carpets and some upholstered furniture.**

*Wet vacuums are vacuum cleaners designed to generally collect water. They can be used to remove water from floors, carpets, hard surfaces and other locations were water has*

*accumulated. They should not be used to vacuum porous materials, such as drywall or gypsum board. They should only be used when materials are still wet due to wet vacuum potentially spreading mold spores if not sufficiently wet or moist. The garage back rooms are still wet and wet vacuuming will be necessary. The second and third floors are dry and wet vacuuming should not be done. When work is complete, the tanks, hoses, and attachments of these units should be thoroughly cleaned and dried after use, since, the mold and mold spores may stick to the surfaces..*

**Method 2: DAMP WIPE surfaces with plain water or detergent solution (except wood – use wood floor cleaner): scrub as needed.**

*Whether alive or dead, mold is allergenic and may be toxic. Mold can generally be removed from non-porous (HARD) surfaces by wiping or scrubbing with water and detergent. It is important to dry these surfaces quickly and thoroughly to discourage further mold growth. Instructions for cleaning surfaces as listed on product labels should be read and followed. Porous materials that are wet and have mold growing on them may have to be thrown out. Molds will infiltrate substance and grow on or fill in empty spaces or crevices and may be difficult or impossible to remove completely..*

**Method 3: HIGH-EFFICIENCY PARTICULATE AIR VACUUM HEPA after the material has been thoroughly dried. Dispose of the contents of the HEPA vacuum in well –sealed 6-mil plastic bags.**

*HEPA High Efficiency Particulate Air vacuums are necessary for areas after materials have been thoroughly dried and contaminated materials removed. HEPA vacuums are also needed for cleanup of dust that may have settled on surfaces outside the remediation area. Care must be taken to assure that the filter is properly seated in the vacuum so that all air must pass through the filter. When changing the vacuum filter, the remediator should wear PPE to prevent exposure to the mold that has been captured. The filter and contents of the HEPA vacuum must be disposed and put in double 6-mil polyethylene plastic bags.*

**Method 4: DISCARD – remove water-damaged materials and seal in plastic bags while inside of containment. Dispose of as normal waste. HEPA vacuum after it is dried.**

*Building materials and furnishings that are contaminated with mold growth and are not salvageable should be double bagged using 6-mil polyethylene sheeting. These materials can then be discarded as ordinary construction waste. It is important to package mold-contaminated material in sealed bags before removal from the contaminated area to minimize the dispersion of mold spores throughout the building. Large items that have heavy mold growth should be covered with polyethylene sheeting and sealed with dust tape before they are removed from the contaminated area.*

A moving truck shall be used for the temporary storage of clean household items. The moving truck shall bring all clean items to a clean storage facility. The items shall stay at this storage facility until the mold remediation is complete. The contractor should pick a storage facility that is free of mold and has the proper atmospheric conditions. The contractor is responsible for all household items. He is responsible for the cleaning, moving, storage, and the re-installment. It is advised that the home owner or representative inspect the items prior to cleaning and after re-installment for any damage the contractor may have caused. All damage is the sole responsibility of the contractor.

Full Containment is required due to the job being greater than 100 SQ FT. A decontamination chamber of airlock should be constructed for entry into and exist from the remediation area. The entryways to the airlock from the outside and from the airlock to the main containment area should consist of a slit entry with covering flaps on the outside surface of each slit entry. The chamber should be large enough to hold a waste container and allow a person to put on and remove PPE. All contaminated PPE except respirators should be placed in a sealed bag while in this chamber. Respirators should be worn until remediator are outside the decontamination chamber. PPE must be worn throughout the final stages of HEPA vacuuming and damp-wiping of the contaminated area. PPE must also be worn during HEPA vacuum filter changes or cleanup of the HEPA vacuum.

1. All carpeting for entire dwelling shall be removed by cutting into small manageable sections rolling and wrapping in 6-mil polyethylene sheeting prior to removal from the residence for disposal.
2. All cupboards and cabinets, throughout the residence, shall be removed, decontaminated by HEPA vacuuming and/or wet wiping with a detergent and water solution, and wrapped in 6 mil polyethylene sheeting prior to removal from the residence.
3. All tile, linoleum, and mastic shall be reviewed on the level directly over the garage. If asbestos material is present, proper asbestos removal techniques should be implemented. The consultant can perform an asbestos risk assessment if insurance carrier or owner are willing to pay additional fees. Asbestos containing materials must be handled only by certified workers. Asbestos containing materials must be disposed of at the proper dump sites.
4. All wood flooring on the first level should be removed to the exterior walls leaving only the floor joists. The wood flooring shall be removed by cutting into small manageable sections rolling and wrapping in 6-mil polyethylene sheeting prior to removal from the residence for disposal.
5. All garage level drywall, wood paneling, plaster, drop ceilings, wall coverings and insulation shall be reviewed and discarded. When complete only the masonry block, studs, joists, and exterior fascia should exist. The second floor shall have temporary clean walk planks as specified by OSHA. The temporary walk planks shall exist in all locations where workers will walk.
6. The second and third floor walls and ceilings shall stay intact except where visible water damage exists. Several locations had visible water damage and mold. These locations shall have the drywall removed 2 feet beyond the contamination.

- All insulation shall be removed at these locations. These locations are all on the third floor and appear to be from past roof leaks. Roughly 150 square feet shall be removed. The drywall shall be removed by cutting into small manageable sections rolling and double wrapping in 6-mil polyethylene sheeting prior to removal from the residence for disposal.
7. All exposed joists, rafters, studs and plywood decking shall be decontaminated. It shall be decontaminated by using a detergent and water solution and a wire brush. Do not soak. The wood should be scrubbed with the wire brush or equivalent until all visible mold is gone. After wire brushing, the timbers shall be washed with a water detergent solution. After washing towel drying shall be done. The final step will require a fine mist of water and bleach solution. Do not soak. This solution shall only be in surface contact for no more than 30 minutes. The water and bleach solution shall be 10 parts water to one part bleach. Antimicrobial solutions or other products can be used and should be applied according to manufactures directions.
  8. The home has a boiler and ductwork in the uiling is minimal. If ducts are encounter they shall be cleaned according to NADCA guild lines.
  9. All other surface on the entire dwelling shall be properly cleaned. See upper flow charts for material process.
  10. Workers are permitted only in designated worker areas.
  11. Humidity shall be controlled for the entire project. Levels of 50 % and lowered should be target levels.
  12. The contractor is resposable for the paying the post abatement testing. Failures will require retesting at additional fees.
  13. Containment must remain sealed and under negative pressure until al viable post abatement testing have passed. Generally this process takes 14-18 days.
  14. New construction is not part of this scope.
  15. All work shall follow applicable Federal, State, and compliance regulations during removal, cleaning, and replacement activities.

## **2 APPLICABLE REGULATION FOR MICROBIAL REMEDIATION**

Below are only some regulations that can apply to the microbial remediation, restoration, abatement or removal project.

- OSHA General Industry Standard 29CFR 1910.
- OSHA Respiratory Protection Standard, 29 CFR Parts 1910 and 1926 (Contractor can download these OSHA requirements generally from internet sources)
- Federal, State and Local Administrative Statues, Codes and Rules may be applicable. (Contractor should be cognizant and is ultimately responsible in knowledge of these potential applicable requirements.
- When applicable Permit Required Confined Space Entry Program (29 CRF 1910.146).
- Contractor shall provide appropriate permits for demolition, electrical, HVAC, plumbing and general construction as required by local municipalities.

**The General Contractor and all Sub-Contractors are responsible for knowing, determining and ultimately complying with the above-mentioned applicable regulations.**

### **3 MINIMAL REQUIREMENTS FOR BIDDING CONTRACTORS**

3.1 All bidding contractors should have one or more of the following credentials or experience.

- State licensed to perform asbestos removal.
- State licensed to perform lead paint or lead dust or lead soil removal.
- Registered General Contractors in fire restoration business.
- Dewatering contractors.
- Contractors that performed mold remediation projects in the last two years.
- Professional Engineer or Architect
- Engineer with certifications in pollution type contaminants.
- Contractor that uses a patented or non patented protocol that has been proven to work in abatement type projects. They will need to provide past project data with proven passing post abatement clearance tests. At least three project data is required. Furthermore, contractor to provide the change of work scope procedure specification that needs to be evaluated by the consultant. Contractor shall not change the consultants scope of work unless proper authorization is given. The contractor ultimately is responsible for proper removal and remediation.
- Government official performing duties in pollutions control.
- Licensed General Pest Applicator with experience in fungicide.
- Similar experience with documented data. This needs to be approved by consultant, insurance company, and or property owner.
- CMRS Certified Mold Remediation Supervisor, CMR Certified Mold Remediation, CIH Certified Industrial Hygienist can perform work as long as they have documented and complete a minimum of three similar projects.

## 4 GUIDELINES

- 4.1 Temporary Lighting and Power:** Power being used should not be in the containment areas. This power should be taken from the electrical service outside the containment work area. All electrical taps, installations, and configurations should be done by only licensed electricians complying with the NEC National Electrical Code, OSHA Occupational Safety and Health Administration regulations, UL Underwriters Laboratories and other relevant state or local codes.

All Circuits shall be GFCI'S Ground Fault Circuit Interrupter type. Large equipment machines such as air-scrubbers, negative air machines, large fans, high volume dehumidifiers or other equipment that uses more than 10 amps shall be on its own circuit. The electrician shall calculate the number of amps used per circuits especially if equipment is running during non work hours.

Temporary lighting shall consist of stand alone fixtures that are all connected to GFCI'S circuits. Several light fixtures may be used for the same circuit as long as the electrician performs the calculations necessary for amperage use.

Lighting candlepower shall be adequate as noted by OSHA or other requirements established by governing authorities.

- 4.2 Temporary Water:** All temporary water connections shall be connected to back flow preventions. All street hydrant water usage shall be in accordance with city guidelines and permits needed when applicable. All discharge of gray water shall be disposed of properly. If debris is mixed with the gray water it shall be screened and discarded properly. All discharge terminations shall be designed as not to permit cross contamination.

- 4.3 Storage facilities and storage locations .** All operations of the contractor shall be confined to areas authorized or pre-approved by the owner, project manager, consultant or other significant authority. No unauthorized or unwarranted entry upon, passage through, disposal or storage of material shall be made in any area not previously approved or authorized. Field modification shall all be pre-approved prior to enactment. The contractor shall be liable for any and all damage caused in such areas, as determined by all pre inspections, all post inspections, all walkthrough inspections with the owner, consultant, contractor or project manager.

- 4.4 Scaffolding and Ladders.** Rolling scaffolding and/or power lifts shall be made available for use by the environmental consultant during post remediation inspections and testing. Contractor shall be aware the post remediation inspections may be several days or weeks after the project completion. All scaffolding and ladders shall meet OSHA standards and comply with local building codes

- 4.5 Project Schedules and Working Hours.** The contractor should be available to work with full size crews continuously from the beginning



to the end of the project. The number of days and hours that work is permitted shall be provided to the contractor prior to bidding.

- 4.6 **Royalties and Patent Fees.** The contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the work of any invention, design, process, product or device as specified for use in the performance of the work.

## 5 SUBMITTALS FOR MICROBIAL REMEDIATION

The listed below are items that should be made available upon request prior to beginning of work. Furthermore, the listed items shall be submitted to the consultant in charge of the job.

- 5.1 Supervisor of the project should submit his or her qualifications. *(People with Supervisor standings in Asbestos or Lead Paint, Hazardous Materials handling, Engineers, Architects, CIE, CMRS, CMR or similar education, certifications, lenience, or experience.)*
- 5.2. Sub-contractor's worker, HVAC people, should submit their qualifications. Under no circumstance should HVAC personal enter or work on the project that are not familiar or trained with pollution type abatements. *(Certifications from such organizations such as the NADCA national air duct cleaners association is an acceptable organization. For information, contact them at 202-737-2926 or 202-347-8847- or nadca@aol.com.)*
- 5.3. Daily reports or logs should be submitted and kept in duplicate. Daily reports and or logs should contain all necessary information. The Supervisor should be trained and knowledgeable in what information is needed. *(Date, time, weather, interior temperature, exterior temperature, humidity interior, humidity exterior, men on site, equipment used, quality control data, work done, items brought to site, items removed from site, site meeting, safety meeting, quality control meetings, problems encountered, site visitors, PPE used, date for negative air, times of filter changes, and all other information that would be necessary for this project.)*
- 5.4. A safety program for this project needs to be submitted. This safety program should include emergency exits, fire protection equipment, site location of the first aid kit, security measures to protect the public, security measures to protect the jobsite. The project shall at all times have a phone or cellular phone for emergency calls.
- 5.5. All chemical LABELS and MSDS's should be submitted. Furthermore, all chemicals, LABELS and MSD's should be posted at the job site for all to see and read. All bottles and like containers should be properly labeled according to standards and regulations
- 5.6. For work in the State of Ohio, if a contractor is to apply certain chemicals that are considered pesticides shall be licensed. A pesticide is defined as any product intended for preventing, destroying, repelling, or mitigating any pest or a plant growth regulator, defoliant, or desicant. Therefore, products such as insecticides, herbicides, rodenticides, and fungicides are all considered "pesticides". Furthermore, contractors applying pesticides shall be familiar with Ohio Administrative Code, Ohio Pest Law, and FIFRA Federal Insecticide, Fungicide, and Rodenticide Act. (Ohio Department of Agriculture Pesticide Regulation Section at 614-728-6987 or 1-800-282-1955.)

NOTE: THESE ARE STRINGENT REQUIREMENTS AND IT IS RECOMMENDED THAT IF A CONTRACTOR DOES NOT HAVE THESE QUALIFICATIONS, HE OR SHE SHOULD USE PRODUCTS THAT ARE NOT COVERED UNDER THESE LAWS OR EMPLOY SUB-CONTRACTORS THAT HAVE THESE CREDENTIALS . **If the contractor is to apply pesticides, a copy of his license should be submitted.**

- 5.7. All disposals of pollution or contaminated materials shall be done in accordance to acceptable methods. Equipment used, transportation vehicles, location of certified dumping grounds etc. Proper records should be kept according to USEPA and State Laws governing disposals. Jobsite records should be kept concerning all material removed from sites.
- 5.8 A copy of the respiratory protection program along with personal protective equipment that will be used should be submitted. (This should include the type of respirators that will be used and the type of PPE needed for a certain contamination concentration. The contractor should consider utilizing a laser partial counter for determination of interior air-borne conditions in determining PPE.
- 5.9 Submittals for the following related items pertaining to the employee-training program is needed.
  - 5.9.1 Protective clothing
  - 5.9.2 Protective equipment
  - 5.9.3 Protective rules for working environment
  - 5.9.4 Respirator fit tests for all workers and supervisors or other personnel that would be entering the project site
  - 5.9.5 Emergency fire procedures that include egress
  - 5.9.6 Emergency exists due to equipment failure
  - 5.9.7 Emergency exists due to PPE failure
  - 5.9.8 Location of job phone with all necessary phone numbers.
  - 5.9.9 Location of clean area for changing, showering and preparing for job site entry and exists.
  - 5.9.10 Procedure for entering clean into the job site and leaving dirty from the job site.

**NOTE: The above can be submitted in a narrative format as long as all areas are covered. If certain submittals require certifications, licenses or continued education requirements the contractor or sub-contractor should make these items available upon request.**

## **6 WORKER AND JOBSITE EXPOSURES**

- 6.1 It is important that workers, supervisors, inspectors, owners, project managers, construction managers and all personnel that enter the project be properly trained and understand the inherent risks. The exposures to or contact with large concentrations of Bio-growth presents a potential health risk to all people involved in the removal process and all people who enter the project during remediation. Risks may include hypersensitivity, pneumonitis, allergic respiratory disease, asthma and etc. Personal with pre-existing chronic disease or immunal compromised or sensitized are at greater risk.

## 7. RECORD KEEPING FOR PROJECT

- 7.1 The job site should have a job office or a job file. This job file should have all job records, licenses, insurance papers, and etc. This file should be out of the immediate work or contamination zone. This file should be made available to all parties that have authority to view it.
- 7.2 The job site should have a Daily Project Log. The following but not limited to should be included in this daily log:
- 7.2.1 Date, weather, outside humidity, outside temperature, interior project humidity, interior project temperature and any other weather related condition. *(The contractor can purchase a hydrometer for roughly \$75.00 from third supply house or they can call Professional Equipment at 1-800-334-9291.)*
- 7.2.2 Work scope performed, men on site working, PPE used, respirator filter changes, equipment used, equipment maintenance, problems occurred on site, phone calls made to off site offices that pertain to this project, materials delivered to site, materials removed from site, failures, accidents and any other relevant condition.
- 7.3 The job site should have a Visitor's Log. All visitor's should sign in to this log book when arriving and leaving the project. Furthermore the visitors should indicate on this log their reason for visit. Under no circumstance shall visitors enter into the contamination zone without proper PPE. All rules shall apply to all visitors.
- 7.4 The job site should have a binder that contains all other reports. These reports are and not limited to: inspections, tests, city inspections, certifications, license, dump record, complaints, and any other relevant job report.

**ALL ITEMS ABOVE SHALL BE NEAT IN ORDER AND LOCATED IN ONE CENTRAL SPOT. THESE RECORDS ARE TO BE MADE AVAILABLE TO ALL PERSONNEL THAT HAVE AUTHORITY TO VIEW.**

## 8 PERSONAL PROTECTION

- 8.1 **Respiratory Protection:** The Contractor shall provide worker with personally issued and marked respiratory protection equipment approved by NIOSH.
1. **Project set up:** Workers shall wear full face respirator equipped with P-100 filter cartridges.
  2. **Active removal:** Workers shall wear full face respirator equipped with P-100 filter cartridges.
  3. **Application of Chlorine compounds:** All workers involved in applying chlorine-based biocides or cleaning solutions shall wear full face respirators equipped with P-100 pre-filter cartridges and cartridges approved for use of chlorine or acid gas.
  4. **Other:** When there is a possibility of exposure to microbial volatile organic compounds, acid gasses, and mold spores, a combination cartridge addressing these items shall be employed. The appropriate cartridges are purple and yellow.
- 8.2 **Protective clothing, hats, gloves and etc:** The contractor shall provide protective disposable clothing. The clothing shall be full body with coveralls, head caps, and boots. The three shall be one piece and all water tight. The contractor shall provide hard hats if required by other job conditions. Other protective items other than disposable clothing (Tyvek TM / Saranex TM) shall be decontaminated if re-used. If tears occur in the coveralls, the worker is to remove, shower and change into a new coverall suit. Contractor is to provide various size coverall suits to fit needs of workers.
- 8.3 **Signs:** The contractor shall provide warning signs that are to be posted at all entrances or openings to the enclosed work area. Signs shall state **“WARNING DO NOT ENTER “ “Microbial Remediation Work in Progress”**. Signs can be altered as long as approved by the consultant.

## **9 EMERGENCY PROCEDURES**

9.1 Emergency procedures shall be developed prior to job start. Appropriate signs shall be posted. Signs shall be posted for all individuals to see prior to entering the job site. All working personnel and other job visitors shall acknowledge and understand the site conditions, potential health affects, exits, and other emergency procedures. When applicable,

9.2 When wet conditions will allow for slippery surfaces, the contractor shall implement a plan to control such conditions.

9.3 When demolition of walls, floors and ceilings is being done, all power to all outlets and lights shall be shut off. The contractor shall provide a site sub panel with all GFCI'S outlets for all site lights and equipment. If walls, floors, and ceilings are to be wet or saturated, power shall be shut down immediately.

9.4 The contractor shall take consideration of fire, explosion, toxic conditions, electrical hazards and confined spaces

9.5 The contractor shall provide portable fire extinguishers within the contamination areas. The contractor shall also provide fire extinguishers outside the contamination area. Consult with the NFPA N10-1984 for detailed information on type of fire extinguisher needed..

## **10 REPARATION OF WORK AREA**

**10.1 Household Items:** All household items including furnishings, moveable objects shall be moved by the contractor to a secure and clean area as designated by the owner. These household items shall be cleaned of all contaminants prior to storage. The cleaning shall be done by first HEPA vacuum, then damp wipe with bleach solution when applicable. The contractor shall be careful in the damp wipe phase as to not damage the household items. Certain household items cannot be properly washed and will need to be discarded. All discarded items are to be double bagged and thrown out.

**10.2 HVAC and Electrical Systems:** Prior to construction barrier and containment enclosure installation, the contractor shall shut down all HVAC and electrical components. All returns and registers shall be taped and shut down.

**10.3 Construction Barriers and Containment Enclosures:** All locations that will receive temporary barriers, tape, 6-mil polyethylene sheeting, contaminants shall be HEPA vacuumed and damp-wiped with a bleach solution. All openings such as vents, plenums, corridors, returns, exhaust air ducts, diffusers, doorways, electrical outlets, switches, and windows with one layer of 6-mil polyethylene sheeting held securely in place. Two layers of 6-mil polyethylene sheeting should be secured to existing structures or to the temporary isolation structure. Temporary isolation walls when applicable shall be required to form the perimeter of the containment work area. These temporary isolation walls shall extend from the floor to as close as possible to the decking or ceiling above. All penetrations of ductwork, piping, and conduit that pass through walls shall be covered with one layer of 6-mil polyethylene sheeting. All gaps, holes, and penetrations shall be sealed with one layer of 6-mil polyethylene sheeting. All openings greater than 24 square feet should be framed with wood studs at 16 inch centers. The contractor can use other framing techniques as long as they are sound and stable. All walls that are not being removed shall be covered with one layer of 6-mil polyethylene sheeting. The floor should be covered first with the 6-mil polyethylene layer extending 12 inches up the walls. The 6-mil polyethylene wall layer shall extend and overlap this 12 inch floor layer. All joints and laps shall have a minimum of a 12 inch splice.

**10.4 Negative Pressure System:** The contractor shall provide 4 air exchanges per hour in the containment area. The contractor shall provide and maintain a negative air differential of 0.02 inches of water inside the work area. The contractor shall supply a sufficient amount of AFD'S to accomplish the goal of 0.02 inches of water negative air differential. This pressure shall be continuous and not interrupted until post abatement testing is complete and satisfactory. The contractor shall have necessary equipment to monitor negative air and see that proper air exchanges occur. The contractor shall implement the use of AFD's air filtration devices with HEPA filters as part of the exhaust ventilation. The contractor shall change all filters as recommended by the manufacture and keep records of these changes. The contractor may implemented the use of partial counters to gain greater life of filters. All partial count data should recorded and documented. All used filters should be double bagged with 6-mil polyethylene and



discarded as waste. The contractor may if he chooses to create positive air in clean areas using the filtered discharge air from the containment area.

The contractor shall provide portable fire extinguishers within the contamination areas. The contractor shall also provide fire extinguishers outside the contamination area. Consult with the NFPA N10-1984 for detailed information on type of fire extinguisher needed. All fire extinguishers shall have their dated certifications attached.

Exhaust shall be to the outdoors through a plywood enclosure. The hole in the plywood enclosure shall be taped and properly sealed. Exhaust and filtered air can be brought back into the dwelling to create positive pressure under the consultant's direction.

## **11 Decontamination Units**

**11.1 Decontamination unit** The unit should consist of three rooms in series separated from each other. The walls for this decontamination unit should be constructed with a temporary isolation wall. These walls shall be constructed with two layers of 6-mil polyethylene sheeting. The floor of this decontamination units shall be two, layers of 6-mil polyethylene sheeting. The doors between the rooms should be double flap overlapping polyelthene curtains. Air locks shall be three feet wide with a triple-flap doorways that separate the rooms is series. All double flaps and triple flap doorways shall be weighted at the bottom. The height of this decontamination unit should be a minimum of seven foot from the floor. The following three rooms are as follows:

- The clean room shall be for changing into clean cloths. The clean room shall accommodate the works for all changing needs. The clean room shall contain new tyvac suits, new respirators, new gloves and other personal protection equipments. Tools, demolition equipments and materials should not be stored in this decontamination unit.
- The shower room should contain hot and cold water. The shower room should contain a drain to collect the grey water. Workers should be told to minimize use of water due to the water going generally into temporary drains. This water should be discarded appropriately according to contamination. The shower room should be inspected daily to ensure no leakage is occurring from the temporary plumbing system.
- Primary decontamination room should be used for storage of equipment, tools and other materials. A labeled drum, lined with at least 6-mil polyethylene, should be provided to collect discarded protective clothing

The contractor may rent or purchase and implement pre-constructed decontamination units. When applicable, the contractor may implement the use of the house facilities in lieu of decontamination units.

**12 INSPECTION OF DECONTAMINATION UNIT ANDS ALL SITE PREPARATIONS.**

12.1 The contractor shall notify the consultant to inspect the entire site, placed equipment, decontamination unit, and all other site protocols. If changes are to be made to the scope of work, this inspection will be the appropriate time to discuss modifications, changes with the consultant. The consultant should be given ample time to make necessary decisions. Written authorization is needed prior to any scope of work changes.

## **13 Clean-up**

- 13.1 Porous material requires removal and disposal. This would include drywall, carpeting, insulation, books partial board newspaper and etc. The contractor shall remove these materials so large amounts of mold spores are not released. These material shall be double bagged with 6 mil polyethylene sheeting. All carpet and rugs shall be HEPA vacuumed prior to disposal.
- 13.2 Non-porous material should be cleaned and reused. This would include metals, glass, hard plastic and etc. Other semi non-porous items such as wood, plaster, and concrete can be cleaned and reused when applicable. All cleaning should be done using detergent solutions that are safe and not toxic. The contractor should be responsible for all damaged material caused by this cleaning process. The contractor should be cognizant of molarity or mixing of solutions.
- 13.3 All structurally connected items such as wood timbers can remain in place. They can be wire brushed, sanded, or scrubbed with abrasive scoring pad.
- 13.4 Air ducts and furnace shall be sealed off prior to mold remediation. These units shall stay sealed off until the entire remedial phase is complete. These units shall be cleaned in accordance to NADCA document entitled General Specifications for the Cleaning of Commercial Heating Ventilation and Air Conditioning Systems modified from residential systems. The cleaning phase shall be done prior to post abatement testing. The final clean-up is conducted after the air ducts and furnace are properly cleaned. Special provisions may be needed for certain duct products.

## 14 DOMESTIC WATER AND HUMIDITY

- 14.1 The jobsite relative humidity shall be or try to be below 55%. The consultant will monitor the humidity and advise the contractor during the project phase. The contractor shall implement the use of dehumidifiers to try to get the humidity below 55%. The contractor may need to run several heavy duty de-humidifiers. If the humidity is above 60% at job completion, the contractor shall inform the owner that other measure are necessary to control the high humidity. A written letter is advise and should contain the following language: *Levels of 50% and greater of indoor relative humidity are desirable for indoor microbial amplification. Moisture conditions and upper levels of indoor relative humidity should be lowered and controlled to ensure future home cleanliness of mold spores or mold growth.*
- 14.2 A bleach, biocide, and disinfectant solution of domestic and tap water should be used in sparse amounts when used for dust control. It can be applied with a manual 1 gallon sprayer or a fogging machine. When applicable, if the mold to be removed is dry, the contractor can carefully wet this area to minimize dust and airborne mold spores during his or her demolition. Indoor dry surface is defined by probe moisture meter of moisture content of less than 14%. If the contractor is to implement this method he or she shall be careful not to wet down surface that are not to be removed. All surface that will receive this method shall be removed within one hour of getting wet.
- 14.3 Surfaces to be cleaned shall be done using damp-wiping methods. Under no circumstance shall these surfaces be soaked.
- 14.4 Removal of all mixtures domestic tap water residual is necessary immediatly with a HEPA vacuum or dry mop. The mop head shall be replaced daily and double bagged.

## **15 POST REMEDIATION OR REMOVAL CLEANING ( AFTER PASSING VISUAL INSPECTION BY THE CONSULTANT)**

15.1 All the disposable material and supplies shall be double bagged and discarded. The entire work area shall be HEPA vacuumed, and cleaned with a detergent solution and wiped down with a 15:1 bleach solution. The work shall start from the ceiling elevation and work down to the floor elevation. The owner shall be informed that all walls and ceilings may require new paint due to being discolored from cleaning solutions.

15.2 **Polyethylene Barrier Removal:** Clean all polyethylene sheeting with a HEPA vacuum prior to removal. Damp wipe all polyethylene sheeting prior to removal using a manual spat bottle of a bleach solution. The first layer of polyethylene shall be treated in the same manor as indicated above. After this layer has been removed, 4 hours of time shall pass or a minimum of 10 full air exchanges. Once complete the second layer of polyethylene shall be treated in the same manor as indicated above.

14.5 The critical isolation barriers shall remain in place. All other remaining surfaces shall be cleaned using a HEPA vacuum. Bristle brush attachments are recommended. All surfaces shall be damp wiped with detergent solution. A final bleach solution wipe down is to be done on the last step.



**17. BARRIER REMOVAL – FINAL CLEANUP – REESTABLISHMENT OF HOUSEHOLD ITEMS AND UTILITIES.**

- 17.1 The post abatement testing must be acceptable prior to any barrier removal. All surfaces behind barriers should be HEPA vacuumed. These surfaces should include and not limited to walls, floors, ceilings, windows and doors. The contractor should also HEPA vacuum all adjacent interior spaces and surfaces within 10 feet of the former location of barriers.
- 17.2 The contractor should remove all equipment and garbage from the site once all final cleaning is complete and acceptance of post abatement testing.
- 17.3 When applicable and if the contract requires, the contractor should reestablish all household items from the temporary location to the original location. The contractor should not move any item back into the clean environment that is dirty or contaminated.
- 17.4 All utilities are to be reestablished.
- 17.5 All fixtures are to be remounted.
- 17.6 All damaged objects are to be repaired or replaced.



## **18 DISPOSAL AND BAGGING**

- 18.1 A dumpster should be located on the site. This dumpster should have a protective cover. The cover is to be installed to protect the environment. The cover should be able to withstand reasonable wind conditions.
- 18.2 All disposable containers shall be double bagged with 6-mil polyethylene sheeting.
- 18.3 Large items shall be double wrapped with 6-mil polyethylene sheeting and all ends taped to form a tight seal.
- 18.4 All materials removed that are to be discarded should be removed from the site at the end of each work day.
- 18.5 Disposal of dumpster shall be done according to EPA, State, and local authorities. Microbial waste can generally be disposed of in normal landfills. If certain chemicals are to be used during remediation, hazardous waste rules may apply. All chemicals, pesticides, biocides, fungicides shall have proper MSD papers and all rules on MSD papers apply. It is advised that separate dumpsters be used when these conditions exist.
- 18.6 The contractor shall properly remove and dispose of asbestos when applicable.

## 19 DEFINITIONS

- Abatement – Suppression or termination.
- Acceptable Indoor Air Temperatures – (Summer 74.0 F – 80.0 F Winter 68.5 F- 76.5 F both are for Dry bulb at 30% Relative Humidity) (Summer 73.0 F – 79.0 F Winter 68.5 F- 74.5.0 F both are for Dry bulb at 50% Relative Humidity)
- Acceptable Indoor Air Humidity – (30-60%)
- AFD – Air Filtration Device
- AIHA – American Industrial Hygiene Association
- Airlock – A system for permitting ingrees or egress without permitting air movement between a contaminated area and an un-containinated area. Typically an airlock is seen in three curtained doorways at least 3 feet part in decontamination units.
- Air Monitoring – The process of measuring the mold spores of a specific volume of air in a time interval.
- AHU – Air Handling Unit providing ventilation, heating, and cooling.
- Ambient Air Temperature – The air temperature on the exterior.
- Anderson Plate Testing – Method of testing viable mold spores. The unit is a culture plated for impacted sampleing.
- ANSI – American National Standards Institute.
- APF – Assigned Protection Factor
- Approved landfill – A site approved for disposal of waste. Certain types of waste will require certain approved landfills.
- Authorized visitor – Any visitor that is approved by the owner, consultant and contractor.
- Bioaerosol – Are generally airborne particles that are either living things or came from living things. Living things for this definition are described as kingdoms. There are five kingdoms: fungi, mineral, protocista. Plantae, and animalia.
- Biocide - Substance or chemical that kills organisms such as molds.
- Bleach Solution - A mixture or morality of 15 parts water to 1 part chlorine bleach.
- CIH – Certified Industrial Hygienist
- CIE – Certified Indoor Environmentalist
- CMR – Certified Mold Remediator
- CMRM – Certified Mold Remediator Manager
- Contaminant – Any physical, che mical, biological or radioactive substance can have an adverse effect on air, water, or soil, or any other interior of exterior surface.
- Containment – The act or condition of containing. Contain – to keep under proper control.
- Clean Room – A clean room in one that is not contaminated. Typically the clean room is last room in a decontamination three room system.

- Containment Barrier – Polyethylene sheeting that seals off the work areas to prevent cross contamination and to prevent distribution of contamination to surrounding clean areas.
- Critical Barrier – Two layers of 6-mil polyethylene sheeting that seals off the site work area.
- Curtained Doorway – A system to allow ingress and egress for one room to another while allowing minimal air movement between rooms, typically constructed by lacing three overlapping sheets of 6-mil polyethylene sheeting over an existing doorway or temporary doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway. Two curtained doorways spaced a minimum of 3 feet apart from an airlock.
- Decontamination Enclosure System – A series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers of materials and equipment. A decontamination enclosure system always contains at least two airlocks. The decontamination system will have a clean room, shower room, and equipment room with airlocks between each room and will be connected to the work area or contamination area.
- EPA – Environmental Protection Agency
- Equipment Room – A contaminated room that is generally part of a decontamination enclosure system.
- Full Face Respirator – A respirator that covers the entire face of the person wearing.
- HEPA Filter – A high efficiency particulate absolute filter capable of trapping and retaining 99.97% of particulate matter greater than 0.3 microns in diameter.
- HEPA Vacuum – A vacuum cleaner that contains a HEPA filter.
- Industrial Hygienist – IH is a qualified person that performs duties with environmental health hazards.
- IAQ – Indoor Air Quality
- Isolation Barrier – Two layers of 6-mil polyethylene sheeting that seals off the site work area.
- Microbe – A microbe is a group of very small life forms. Microbes are so small that they usually can only be seen while using a microscope. They are also bioaerosols and are grouped as : viruses, bacteria and fungi.
- Micron – One millionth of a meter also known as a micrometer. This is approximately 1/25,000<sup>th</sup> of an inch. To give you a sense of scale, the average human hair is approximately 75 microns in diameter.
- MSDS – Material Safety Data Sheet
- Mycotoxins – A toxin metabolite produced by fungi.
- Negative Pressure – An atmosphere created in the site work area enclosure such that dust, mold spores, or other airborne contaminants are sucked or drawn through a filtration system.

- NIOSH – National Institute for Occupational Safety and Health, which was established by the Occupational Safety and Health Act of 1970.
- OSHA – Occupational Safety and Health Administration. This was created by the Occupational Safety and Health ACT of 1970.
- PEL – Permissible Exposure Limit as stated by OSHA rules.
- PAPR – Powered Air Purifying Respirator.
- Psychrometric Chart - A chart used for determining moisture, humidity, dew points and other indoor air quality conditions. Mostly used as a tool in the drying industry.
- Pulmonary Function Tests – A medical examination required to determine the health status of a person's lungs.
- PVC – Generally known as plastic plumbing pipes or polyvinyl chloride.
- Qualitative Fit Test – A method of testing a respirator's face to face piece seal by covering the inhalation or exhalation valve and either breathing in or out to determine the presence of any air leaks.
- Respirator Program – A written program established by an employer, which provides for the safe use of respirators.
- Shower Room – The center room of a decontamination system. This room is the room between the clean room and equipment room in the worker decontamination enclosure system. This shower should be equipped with cold and hot water. This room shall have airlocks on both sides.
- Surface Wipe Sampling or Swab Sampling – A method of testing surfaces using a sterile swab to determine microbial contamination
- TLV – Threshold Limit Values are established by the American Conference of Governmental Industrial Hygienists. These are levels that workers can be exposed to with minimal or no adverse health effects.
- TWA - Time weighted Average is the average exposures levels set by OSHA of other agencies used in air sampling.