

Pre-Demolition Environmental Checklist

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Planning to demolish a building? Here is a handy checklist to help building owners and inspectors, demolition contractors, consultants, sub-contractors and others identify and address environmental issues in a demolition project and find out how to properly handle any hazardous or problem materials.

Thoroughly inspect your project site before beginning any demolition. Carefully planning your deconstruction project can save time, money and resources!

All projects will generate a large quantity and variety of materials that can be recycled or reused. Keeping them separated and free of hazardous problems will make recycling easier and can significantly reduce disposal costs.

Bear in mind that it's illegal to burn an unwanted building. The only exception is for a fire department practice burn of a standing structure where the material that's illegal to burn has already been removed. See further details under "Open Burning" below.

This document lists commonly-found building materials and products that may pose environmental or health problems. It references specific regulations which must be addressed for many materials and points to sound guidance on handling others. It is not intended to substitute for reading the rules and statutes and making your own determination of how they apply to your demolition project.

The examples presented here do not represent an exhaustive listing of types of materials that may be required to be removed from a building prior to deconstruction.

Asbestos

Asbestos is a known human carcinogen which can cause other serious health problems when disturbed and inhaled. Commercial, industrial and residential structures commonly contain Asbestos Containing Materials (ACM).

The disturbance of asbestos is regulated in part by Chapter NR 447, Wisconsin Administrative Code. Prior to beginning a demolition or renovation project, the owner/operator of a structure is required by NR 447 to have the structure inspected for the presence of asbestos by an asbestos inspector licensed by the WI Department of Health and Family Services (DHFS). The DHFS maintains a list of licensed inspectors for the public's review. This inspection will determine the categories of asbestos present in the structure. As a result, some categories of asbestos may be able to remain in place. Others will have to be removed before the project is started.

Two different state agencies and three different state programs have authority over asbestos removal, storage, transport and disposal. Look for contact information on pages 6 and 7.

- ◆ The **DHFS** regulates asbestos training accreditation and certification for inspectors, management planners, project designers, abatement workers and supervisors. The DHFS also requires prior notification for all asbestos removals. Contact the DHFS Asbestos and Lead Section for more information about these requirements.
- ◆ The **DNR Air Management Program** regulates disturbance of regulated asbestos containing

material, as determined by the inspection. In the case of an asbestos removal that involves greater than 260 linear feet of pipe insulation or 160 square feet of any other regulated ACM, a notification of intent must be filed with the DNR. For a demolition, a notification of intent must be filed with the DNR in all cases, regardless of the amount of asbestos present. This notification must be postmarked at least 10 working days before the demolition or removal will occur. For more information about these requirements, contact the DNR Asbestos Coordinator.

The **DNR Waste Management Program** regulates generation, storage, transport and management of solid and hazardous wastes, including any ACM and other construction and demolition materials.

The following checklist notes the various building components and the suspect types of ACM that a building might contain. This list is by no means all-inclusive. All layers of materials, behind walls, ceiling spaces, etc., should be inspected.

HVAC Systems: Duct, pipe and joint insulation (elbows/joints are often coated with asbestos fiberglass insulation on the straight runs), forced air dampers, wall, floor and chimney penetrations, lining and mortar, fire brick, fire-proofing materials (such as transite sheets or heavy paper), boiler insulation, flexible fabric connectors, packing/gaskets and adhesives. paper backing, mastic/adhesives (floor tile, carpet, etc.), grout and felt paper under hardwood floors.

Electrical: Insulators, spark arrestors and transite panels in electrical boxes, wiring insulation, ducts/conduits (transite pipe) and light fixtures.

Interior Walls: Wall plaster, joint compound, patches, textured paint, other spray-applied materials, transite wallboard and fire doors.

Exterior Walls: Window putty/glazing, mortar, transite siding, asphalt shingles/siding, felt under siding, stucco, paint (rare except in commercial applications, where it was usually applied as a very thick, often silver-colored coating) and fire doors.

Roofing: Asphalt shingles, tar-type coatings (often around vents, chimneys, etc.), transite shingles, roofing felts (often under a layer of other material),

flashings, mag-block type material under other material. Check all flat roofs and multiple layers.

Ceilings: Tiles (which may or may not be asbestos; also, asbestos debris from pipe insulation may be laying on top of tiles), tile adhesives, textured paint, wall plaster, joint compound, patches, other spray-applied materials and transite wallboard. Spaces above ceilings should also be checked.

Plumbing: Pipe wrap, pipe joints, transite counter tops in bathroom, faucets/ packing gaskets and adhesives.

Flooring: All sizes of vinyl floor tile, sheet flooring, linoleum.

Insulation (ceiling/wall): Blown-in, spray-applied and block.

Miscellaneous: Fire curtains and blankets, laboratory tabletops, fume hood lining, blackboards and fire-resistant clothing (gloves, hoods, aprons, etc.).

CFCs, Halons, and other refrigerants

Hydrochlorofluorocarbons (HCFCs) and halons are manmade substances that damage the earth's protective ozone layer high in the atmosphere, allowing greater exposure to the sun's dangerous ultraviolet rays. They are known as *ozone-depleting refrigerants*. Increased skin cancer, eye cataracts, immune system deficiencies and crop damage are some of their harmful effects. CFCs and HCFCs are commonly found in refrigeration and air conditioning equipment. Halons are used in portable and installed fire control equipment.

REFRIGERATION AND AIR-CONDITIONING EQUIPMENT

Under chapter NR 488, Wisconsin Administrative Code, ozone-depleting refrigerants may not be released to the environment during salvaging or dismantling activities. Federal laws also prohibit releases and also require recovery of these substances, as well as other refrigerants that are

global warming gases or pose other health or environmental problems. They must be properly recovered, using approved equipment operated by qualified technicians. The entity recovering these refrigerants must be registered with the DNR and supply documentation to whomever receives the scrapped equipment that the refrigerants were properly removed.

Air Conditioners (rooftop, room, and central)

Vending Machines/Food Display Cases

Dehumidifiers

Refrigerators/Freezers/Chillers

Heat Pumps

Water Fountains/Coolers

Walk-in Coolers (refrigeration or cold storage areas)

FIRE EXTINGUISHERS

Check both portable and installed fire suppression systems. Look for those containing halons. Do not discharge halon fire extinguishers; intentionally releasing these substances is prohibited under federal regulations. Halons and halon-containing equipment must be recycled or disposed of in accordance with EPA standards. If you send halon-containing equipment offsite for disposal, it must be sent to a manufacturer, fire equipment dealer or recycler operating in accordance with National Fire Protection Association standards (NFPA10 and NFPA12A). Halons must be recovered by trained technicians. Contact the Halon Recovery Corporation for more information. (See page 6.)

Lead

Inhaling or swallowing lead can cause serious acute or chronic health effects to the brain and endocrine, reproductive, and immune systems. Lead plumbing and lead-based paint are commonly found in many older buildings. Although lead paint use was discontinued in 1978, many buildings have multiple layers of paint and should be examined carefully. When recycling demolition debris, dispose of painted wood in a landfill. Do not burn or chip wood containing lead paint or use it for landscaping.

State law prohibits the sale or transfer of any fixture or other object containing lead-bearing paint that

might be placed upon any surface of a dwelling ordinarily accessible to children.

Lead Based Paint: Woodwork, metal equipment, interior/exterior uses

Lead flashing molds and roof vents

Lead pipes and solder

Lead-Acid Batteries: Lighting, exit signs, security systems

Mercury

Mercury is a heavy, shiny, silvery-white poisonous metal that is a liquid at room temperature. Mercury can be found in thermometers, barometers, thermostats, dental offices, blood-pressure devices, and fluorescent and other types of light bulbs. Liquid mercury evaporates at room temperature and gives off harmful, invisible, odorless vapors. Breathing these vapors causes the most harm to people, but mercury can also be harmful when swallowed or when it contacts broken skin. Mercury is quite toxic: it causes birth defects and works its way into the food chain. Women and children are most at risk from mercury poisoning, which can cause brain and nerve damage resulting in impaired coordination, blurred vision, tremors, irritability and memory loss.

Mercury is a fast-moving liquid that spreads quickly. Prompt containment and control of both the liquid and its vapors is very important. If any mercury is spilled or released, you must report the spill immediately by calling the DNR 24-hour Spills Hotline. (See pages 6 and 7.)

Do not remove mercury from a device such as a switch or thermostat. Keep the product intact as you remove it and store it in a covered container in a manner that will prevent breakage, spillage, or release. Label the container to assist proper handling and disposal. Most such devices can be shipped off to recycle the mercury.

HEATING, VENTILATING AND AIR-CONDITIONING SYSTEMS AND APPLIANCES

Devices in this category control a variety of switch functions such as temperature, water pressure, air pressure, on/off, and flow control. Check thermostats

and any control associated with air handling units for switches containing mercury.

Thermostats

Aquastats

Pressurestats

Firestats

Manometers

Thermometers

Boilers, Furnaces, Heaters & Tanks

Mercury Flame Sensors by pilot lights

Thermometers, Gauges

Pressure-trol

Float or Level Controls

Space Heater Controls

Sump Pump Limit Switches

Electrical Systems

Load Meters and Supply Relays

Phase Splitters

Microwave Relays

Mercury Displacement Relays

Other Industrial Equipment and Areas of Mercury

Concern: Any control used for measurement of vacuum, pressure, fluid level, temperature, or flow rate could contain mercury. Included are thermostats, thermometers, manometers, pressurestats, etc. Other switches may have been used in sump pumps, water cleaning systems, pneumatic control switches, old clocks and other areas.

Switches for lighting may use mercury relays:

Look for any control associated with exterior or automated lighting systems, such as "silent" wall switches.

Specialty Buildings and Locations: Dairy barns, hospitals, clinics, laboratories, dental offices and schools. Mercury may be found in sink traps and many other pieces of equipment and devices.

LIGHTING

Several types of lights can contain mercury and must be properly processed for disposal. These include:

Fluorescent Lights

High Intensity Discharge: Metal Halide, High Pressure Sodium, Mercury Vapor

Neon

PCBs (polychlorinated biphenyls)

PCBs are a family of chemicals manufactured and used in the United States until the late 1970's, which were mostly used in electrical devices like capacitors, transformers and lighting ballasts to protect their oils from breaking down at high temperatures. These substances are strictly regulated because of their toxicity and persistence in the environment. PCBs continue to be a major source of fish contamination, leading to fish consumption advisories for people.

Management of PCBs is based on their concentration in an item. Materials with PCB concentrations of 50 parts per million (ppm) or greater are regulated by the U.S. EPA under the Toxic Substances Control Act.

Materials with PCB concentrations less than 50 ppm are regulated by the State of Wisconsin under Chapter NR 157, Wis. Adm. Code.

For electrical devices manufactured prior to 1978, it is safe to assume that they contain PCBs and should be managed accordingly. Most equipment manufactured after this time will say "PCB FREE." The following is a list of areas in buildings where PCBs may be found:

Transformers

Capacitors (appliances, electronic equipment)

Heat Transfer Equipment

Light Ballasts

Specialty Paints, such as for swimming pools or other industrial applications

Sumps or oil traps in maintenance and industrial facilities

Other Environmental Issues

The following is a list of other environmental and regulatory issues that should be considered prior to demolition. Check with DNR websites under "Publications" for additional information.

Appliances: May contain ozone-depleting or other regulated refrigerants; PCB-containing capacitors or ballasts; or mercury; and must be processed by a DNR-registered appliance demanufacturer.

Batteries (non-lead-containing): May be found in smoke detectors, emergency lighting systems, elevator control panels, exit signs, security systems and alarms. Batteries may be managed as universal wastes as allowed by chapter NR 690, Wisconsin Administrative Code.

Computers: May contain hazardous materials such as lead, cadmium, chromium, and mercury and may be regulated as hazardous wastes if not recycled.

Demolition Waste: Many materials, fixtures and components can be donated, sold or recycled prior to demolition. Clean brick, building stone, concrete and asphalt may be stockpiled for crushing and reusing in future building projects. Clean drywall waste can be returned to manufacturers to make into new sheetrock, and some farmers are land-spreading clean, crushed drywall waste to enrich soil. It's illegal to burn demolition wastes. See further details under "Open Burning."

Exit Signs: Many self-luminous exit signs contain significant amounts of radioactive tritium. All self-luminous exit signs are required to have a permanent label affixed to the sign that identifies it as containing radioactive material. In addition, the label will include the name of the manufacturer, the product model number, the serial number, and the quantity of tritium contained. It is illegal to abandon or dispose of these signs except by transferring them to the manufacturer or others licensed by the U.S. Nuclear Regulatory Commission to accept them.

Hazardous Waste (HW): All HW, including household HW, must be properly handled and

disposed of prior to demolition. Hazardous wastes can include ignitable, corrosive, reactive or toxic liquid, solid or contained gaseous wastes.

Oil: Used oil in containers or tanks, hydraulic oils in door-closers, elevator shafts, etc. must be collected and properly recycled or disposed of prior to demolition.

Open Burning: It is illegal to burn unwanted buildings in Wisconsin. State laws prohibit the burning of painted, treated or unclean wood, asphalt, plastics of any kind, oily substances, tires and other rubber products, wet rubbish and other materials. In the case of building demolition, that would include roofing materials, all kinds of flooring materials, insulation, plywood and other composition board, electrical wiring, cabinetry and countertops, and plastic plumbing.

The only exception is for a fire department practice burn of a standing building from which the materials that are illegal to burn have already been removed.

One-time burning of clean, unpainted, untreated wood is allowed with approved methods and prior notification of the DNR. However, in the case of demolition waste, it would be necessary to separate out all the illegal materials and painted or treated wood before any burning could be allowed.

Burning permits are often required by local regulations and state law. Many communities have local ordinances about open burning that are even stricter than the statewide requirements. Check with the local municipality and DNR officials to see if you must obtain a permit to burn these materials at your location.

Solid Waste: Recycle and reuse as much as possible. For example, paper (cardboard, files, magazines, etc.), steel and tires should be recycled. All non-building components such as files, books, trash, desks, and chairs must be removed prior to demolition, unless the building materials are being taken to a solid waste landfill. Landfills that are licensed to accept only construction and demolition wastes cannot take non-building materials, so check with any landfill prior to your demolition project to be certain they can manage your wastes.

Smoke detectors: Smoke detectors that contain a small amount of radioactive material will be labeled and should be returned to the manufacturer for

disposal. Otherwise dispose of smoke detectors in the trash.

Soil Contamination: A qualified environmental consultant can conduct environmental property assessments.

Spills: In Wisconsin, all discharges of hazardous substances that adversely impact, or threaten to adversely impact public health, welfare or the environment must be immediately reported to the DNR via the Spills Hotline.

Storage tanks: Storage tanks store material such as oil, solvents and other petroleums, or other dangerous (toxic or flammable) materials. The tanks may be indoors or outdoors, buried or above ground. The DNR does not require removal except for leaking underground storage tanks. Determination of responsibility for potential liability lies with the property owner and buyer.

Well Abandonment: Unused and improperly abandoned wells are a significant threat to groundwater quality. If not properly filled, abandoned wells can directly channel contaminated surface or soil water into groundwater. Chapter NR 812, Wis. Adm. Code, requires that any wells or drillholes be properly filled prior to any demolition or construction work on the property.

Wood Waste: Clean, untreated wood can be recycled or chipped for ground cover. Treated or painted can go to a licensed construction/demolition landfill. Burning painted or treated wood waste is prohibited. See Open Burning, above.



Additional Resources

WEBSITES

Publications, contact names, and state regulations

The DNR Waste Management, Remediation and Redevelopment, and Air Management program websites provide access to publications, a list of DNR contacts, and electronic versions of administrative codes and state statutes. A special website is devoted to open burning as well.

For Waste Management, see www.dnr.state.wi.us/org/aw/wm/

For Remediation and Redevelopment, see www.dnr.state.wi.us/org/aw/rr/

For Air Management, see www.dnr.state.wi.us/org/aw/air/index.htm

For Open Burning, see <http://dnr.wi.gov/environmentprotect/ob/>

INFORMATION ABOUT SPECIFIC DEMOLITION MATERIALS AND REMOVAL PROCEDURES

Wisconsin Laws and Regulations

For copies of Wisconsin statutes and administrative codes, contact the Revisor of Statutes at 608/266-3358 or www.legis.state.wi.us/rsb/code.htm

Asbestos

Asbestos and Lead Section, Dept. of Health and Family Services: 608/261-6876.

Asbestos Coordinator, Dept. of Natural Resources: 608/266-3658.

CFCs, halons, and other refrigerants

DNR Requirements for Refrigerant Recovery During Salvage:

<http://www.dnr.state.wi.us/org/aw/air/reg/refrig/AM10193rev1205.pdf>

DNR Refrigerant Recovery Program:

<http://dnr.wi.gov/org/aw/air/reg/refrig/index.html>

Halon Recovery Corporation: 1/800/258-1283;
www.halon.org

Lead

EPA Lead Hotline: 1/800/LEAD-FYI.

Mercury

DNR Spills Hotline: 1/800/943-0003.

ORGANIZATIONS TO CALL FOR FURTHER INFORMATION

Business Material Exchange of Wisconsin (BMEX) is a Material Listing Service designed as a clearinghouse to match manufacturers and other businesses that need materials with companies that have reusable, surplus or by-product materials available. Call 800-364-3233 or see www.bmex.org

UW-Extension Solid and Hazardous Waste Education Center (SHWEC) provides education and technical assistance programs to businesses and communities on source reduction, recycling, solid waste management, and pollution prevention. For practical tools to reduce, reuse and recycle wastes generated during construction and demolition projects, with checklists, how-to steps, on-site worksheets and markets for reusable materials, order *Construction Resources: A Waste Reduction and Recycling Guide for Wisconsin Builders and Contractors*, SHWEC Pub#605.SG.9710. Call 608-262-0385 or see www1.uwex.edu/ces/shwec/

WasteCap Wisconsin A public/private partnership that offers site visits, workshops, fact sheets, peer-to-peer exchanges and internet resources to provide solid waste reduction and recycling assistance for Wisconsin's business community. All services are free. Wastecap is located at 2647 N. Stowell Ave, Milwaukee, WI 53211-4299. Call 414-961-1100, or see www.wastecapwi.org

For additional information on waste management requirements and recycling options, contact the waste management staff at these DNR regional offices:

- Northeast Region, Green Bay
920/492-5800

- Northern Region, Rhinelander
715/365-8900
- Northern Region, Spooner
715/635-2101
- Southcentral Region, Fitchburg
608/275-3266
- Southeast Region, Milwaukee
414/263-8500
- West Central Region, Eau Claire
715/839-3700

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This publication is available in alternative format upon request. Please call (608) 266-2111 for more information.

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