



EPA Urged to Shut Down Dangerous Asbestos Removal Method 12/15/2011

The U.S. Environmental Protection Agency's Inspector General has just signed an "Early Warning Report" that will shut down a dangerous and unapproved asbestos removal method that two EPA offices have been testing for the past seven years. The report supports what Public Justice has been arguing -- that the method both endangers public health and doesn't work.

The approved method requires all asbestos to be removed from a building by trained specialists wearing protective gear before it is demolished. Under the unapproved method, called the "Alternative Asbestos Control Method," or AACM, most of the asbestos-containing materials are left in place during demolition. Water with added surfactants is sprayed on the building to try to suppress asbestos release and contamination.

The report, "Use of Unapproved Asbestos Demolition Methods May Threaten Public Health" (see link to report and other documents below), states that the EPA conducted

tests of this method and each time got releases of asbestos, potentially exposing on-site workers and nearby residents to the deadly carcinogen.

Public Justice, environmental groups and labor unions have long urged the EPA to shut down its asbestos-removal experiments, but the agency would not. So Public Justice and the Natural Resources Defense Council filed a Freedom of Information Act (FOIA) request to get the underlying data about these experiments. The EPA did not release most of the documents, numbering over 26,000 pages, until after the groups sued in federal court to force disclosure.

The released documents include several showing that one of the EPA's own senior scientists found that the asbestos-removal tests did not comply with health and safety standards and may have endangered demolition workers and agency employees. A detailed summary of the history of the AACM can be found below.

The Department of Energy recently used the unapproved method at its Hanford, Wash., site and is planning to use it again in Paducah, Ky., but today's Inspector General report states clearly that government agencies should immediately stop any further use of this method.

"We hope this new report will finally put the nail in the coffin of this unapproved and dangerous method of asbestos removal," said Jim Hecker, the director of Public Justice's Environmental Enforcement Project.

The report also says that the EPA should notify all workers and nearby residents who were exposed during the tests.

Fact Summary About Recently-Released EPA Documents Concerning Its Alternative Asbestos Control Method Tests

On November 10, 2011, after fighting requests for public disclosure for more than a year, EPA released internal reports that raise serious concerns about the safety of an experimental method that EPA has been testing for the past five years. That method would relax requirements for the removal of asbestos in demolished buildings. Concerned about the safety of this new method, Public Justice and NRDC had asked EPA to release its data and other documents about its tests. EPA refused, forcing these organizations to bring a federal lawsuit under the Freedom of Information Act (FOIA) compelling disclosure. At the last minute, EPA released documents that included a report by one of its own senior scientist finding that EPA did not comply with health and safety standards and may have endangered demolition workers and its own employees during the tests. While EPA recently decided to stop working on the new method, the Department of Energy has plans to use a similar method to remove asbestos from its facilities.

A. The Asbestos NESHAP and the Wet Method

Asbestos is a known carcinogen that is present in the structures, insulation and material components of many buildings in the United States. Congress has found that "medical science has not established any minimum level of exposure to asbestos fibers which is considered to be safe to individuals exposed to the fibers." 20 U.S.C. § 4011(a)(3).

EPA currently regulates the demolition and renovation of asbestos-contaminated buildings under its National Emissions Standards for Hazardous Air Pollutants (NESHAP) program, which it administers under the Clean Air Act. 42 U.S.C. § 7412(d)(1), (d)(2); 40 C.F.R. § 61.145. Under that standard, the owner or operator of a demolition activity must "[r]emove all RACM [regulated asbestos-containing materials] from a facility being demolished or renovated before any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal." 40 C.F.R. § 61.145(c)(1).

There is, however, an emergency exception to this requirement for pre-demolition removal of asbestos: total removal of RACM is not required "[i]f the facility is being demolished under an order of a State or local government agency, issued because the facility is structurally unsound and in danger of imminent collapse." *Id.* § 61.145(a)(3). Under

this limited exception, workers on site may spray down the asbestos in order to suppress release and contamination. *Id.* The dampened asbestos then remains in place during demolition. *Id.* § 61.145(a)(3), (c)(4)–(9). This exception is commonly referred to as the “wet method” or “wet demolition.”

B. EPA’s AACM Tests

In recent years, EPA has explored changing the asbestos NESHAP to allow for widespread use of a modified wet method called the Alternative Asbestos Control Method, or AACM. Under the AACM, most of the asbestos-containing materials are left in place during demolition, and water with added surfactants is sprayed on the building to suppress asbestos release and contamination. EPA approval of the AACM would relax existing EPA regulations by allowing asbestos to remain in a building during demolition even though the building is not structurally unsound and in imminent danger of collapse. In effect, it would convert the wet method from a limited emergency exception to a broadly-applicable method.

EPA planned several tests of this method on several buildings in Texas and Arkansas. The first test was to be done in June 2004 on the Cowtown Inn in Ft. Worth, in the middle of a residential neighborhood, but opposition from local residents forced EPA to abandon that plan. At the time, EPA’s Asbestos Coordination Team (ACT), composed of senior EPA scientists, objected to the test, stating that it rested on “numerous assumptions that are not clearly supported by scientific studies.”

In August 2004, St. Louis city officials tried using the wet method to demolish the Landscape Building at the St. Louis airport. The ACT “concluded that not only did the study design of the demolition limit the ability to generalize the results, but that the data indicate statistically significant downwind asbestos release and possible exposures during and following the wet demolition of the building.” EPA’s final May 2005 report on that test found that downwind air monitors “captured some asbestos fibers that were obviously released during the demolition process.” EPA conducted its first “official” test of the technique in April 2006 (AACM1). During this project, EPA demolished two abandoned army barracks in Fort Chaffee, Arkansas, using the AACM for one building and the prescribed NESHAP procedures for the other. EPA’s subsequent report on this test concluded that the AACM released more asbestos and particulates into the air than did the NESHAP method. The report also stated that “EPA does not endorse the AACM at this time as an approved method under the asbestos NESHAP for demolishing buildings containing” asbestos.

In 2007, EPA conducted two more tests of the modified wet method: AACM2 and AACM3. AACM2 took place in July 2007 at a different building at Fort Chaffee, this one with asbestos siding. AACM3 occurred in December 2007 at the Oak Hollow Office in Fort Worth, in the midst of a residential area. In 2008, EPA’s Office of Research and Development, which supervised AACM2 and 3, solicited public comment on the draft reports on those two tests and held an external peer review session to review the draft reports. 73 Fed. Reg. 42,573 (July 22, 2008).

Public Justice and NRDC have consistently opposed the AACM and EPA’s pilot tests of this method, contending that the AACM is ineffective, unsafe and endangers public health. Both organizations, along with a host of nonprofit groups and labor unions, signed a letter to EPA Administrator Jackson in May 2010 asking her to disclose the documents underlying the two draft reports and to discontinue testing of the AACM. This letter identified several troubling aspects of the tests. For instance, air monitors, settled dust monitors, water samples, and pavement samples contained asbestos; photographs depicted site workers wearing no safety equipment; and the agency discharged asbestos-contaminated wastewater into a public sewer system without a permit and without first measuring the amount of contamination.

C. FOIA Request to EPA³ In June 2010, concerned about the safety and efficacy of the AACM, NRDC and Public Justice submitted a FOIA request asking EPA to produce the data and other documents associated with AACM2 and 3. After receiving only a minimal response from the agency, Public Justice and NRDC filed a complaint in the U.S. District Court in Manhattan in April 2011, alleging that EPA had failed to produce all responsive records and had withheld records unlawfully. In September, EPA finally released thousands of responsive documents, but withheld many others and invoked exemptions from release improperly.

Some of the released documents showed EPA misconduct in how it performed the AACM2 and 3. For example, photographs showed an EPA employee power-hosing the AACM2 transite building prior to demolition while wearing a T-shirt and flip-flops, without any of the required protective respiratory gear. (1) This occurred despite the fact that “the transite panels on the building had been degrading over the years and were contributing significant asbestos to the immediate paved area surrounding the building.” (2) Worse still, EPA cropped the photograph in its draft report in a manner that concealed the potential violation, showing only the worker’s hand holding the hose and not the rest of his body or clothing. (2) A subsequent photo in the draft report shows another worker wearing protective gear doing the same task. (2) EPA reproduced the cropped photo in a number of public PowerPoint

presentations. Other photographs from AACM3 show workers wearing no facemasks or other protective respiratory equipment when engaged in potentially hazardous activities during and shortly after the demolition. These activities include sampling the asbestos-contaminated slab, standing near the dumpster while it was being loaded with asbestos debris, and pouring asbestos-contaminated water into that dumpster. (3)

Other released documents showed that EPA misused the emergency wet method exception during the AACM2 test. The purpose of this exception is to protect employees from having to work in an unsafe building at risk of collapsing, which would otherwise occur if full removal of asbestos were required pursuant to the NESHAP. For the AACM2 building, EPA obtained a city determination that the building was unsafe and in danger of imminent collapse, and then allowed its employees and private contractors to nail 1550 square feet of additional asbestos onto the building prior to the test. (4) EPA ordered this work on the building even though it was determined to be in danger of collapse at any minute.

D. The Nine Released Documents on the Safety of the AACM Tests

In December 2009, in response to comments on the AACM2 and 3 reports from other EPA offices, Sally Gutierrez, the director of the Office of Research and Development's National Risk Management Research Laboratory (NRMRL), "asked [her] staff to complete a thorough review of the health and safety measures implemented during the course of these research studies." (5) EPA's Steve Musson, the agency's most senior staff member on these issues and a certified industrial hygienist, then performed three reviews of AACM2 and 3 in January through March of 2010. (5) EPA withheld nine documents about these health and safety reviews. After Public Justice and NRDC announced plans to litigate EPA's withholding of these documents, and on the same day in November that the motion seeking release was due to be filed in court, EPA relented and released those documents. Three of the nine released documents contain the results of Mr. Musson's analysis. (5)⁴ Although Mr. Musson did not analyze fully whether EPA had complied with all regulatory standards, the released documents show that he made the following findings, which raise serious concerns about EPA's conduct during the tests:

- Workers at the perimeter of the work area did not wear personal air monitors. Significantly, air samples at this boundary "did show appreciable levels of asbestos."
- EPA did not take required short-term samples of asbestos levels in the air.
- EPA officials never signed or approved the Health and Safety Plans that were drafted for the tests.
- EPA employees did not complete required training for respiratory protection.
- The test developers did not properly determine the area within which people could be exposed to asbestos during the tests, or the potential distance that asbestos fibers could travel.
- The size, location and distance of a plastic barrier to protect nearby occupied buildings "appear to be arbitrarily determined."

Mr. Musson also stated that, based on the limited and inadequate data collected, EPA employees and workers were not exposed above OSHA limits for worker exposure. However, those individuals were likely exposed to some quantity of asbestos, and there is no safe level of exposure to that substance. OSHA stated in 1994 that its exposure limit of 0.1 f/cc, which was used by Mr. Musson, "would further reduce, but not eliminate, significant risk" of cancer. 59 Fed. Reg. 40964, 40966 (Aug. 10, 1994). So far as we can determine, these individuals have never been informed about their exposure; all of Mr. Musson's analysis was kept hidden from the public until now.

In July 2011, during the litigation discussed above concerning withheld AACM documents, EPA officials decided to stop further work on the AACM. EPA's decision memorandum cited "important technical deficiencies" with the tests, including the use of the wrong air pollution model and "technical problems that arose during sampling and analysis." (6) While the memorandum did not state that EPA is abandoning the AACM altogether, it concluded that because the agency is not considering revisions to the asbestos NESHAP "at this time," it would be "more prudent" for the agency to use its resources on other "higher priority research needs."

Nevertheless, the Department of Energy (DOE) is still trying to use alternative methods for asbestos removal. DOE plans to demolish some of its facilities that contain millions of square feet of transite siding, which has up to 50% asbestos. In advance of these demolitions, DOE conducted an experiment that dropped transite inside a test enclosure after it was sprayed with water. DOE found that the water spray "does not penetrate the transite and

does not decrease airborne fiber concentrations upon breaking.” See
<http://www.em.doe.gov/EM20Pages/PDFs/TFS%20-%20Transite%20Panel-FINAL-JD-PK.pdf>.

§ 61.145 Standard for demolition and renovation.

(a) *Applicability.* To determine which requirements of paragraphs (a), (b), and (c) of this section apply to the owner or operator of a demolition or renovation activity and prior to the commencement of the demolition or renovation, thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos, including Category I and Category II nonfriable ACM. The requirements of paragraphs (b) and (c) of this section apply to each owner or operator of a demolition or renovation activity, including the removal of RACM as follows:

(1) In a facility being demolished, all the requirements of paragraphs (b) and (c) of this section apply, except as provided in paragraph (a)(3) of this section, if the combined amount of RACM is

(i) At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components, or

(ii) At least 1 cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously.

(2) In a facility being demolished, only the notification requirements of paragraphs (b)(1), (2), (3)(i) and (iv), and (4)(i) through (vii) and (4)(ix) and (xvi) of this section apply, if the combined amount of RACM is

(i) Less than 80 linear meters (260 linear feet) on pipes and less than 15 square meters (160 square feet) on other facility components, and

(ii) Less than one cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously or there is no asbestos.

(3) If the facility is being demolished under an order of a State or local government agency, issued because the facility is structurally unsound and in danger of imminent collapse, only the requirements of paragraphs (b)(1), (b)(2), (b)(3)(iii), (b)(4) (except (b)(4)(viii)), (b)(5), and (c)(4) through (c)(9) of this section apply.

(4) In a facility being renovated, including any individual nonscheduled renovation operation, all the requirements of paragraphs (b) and (c) of this section apply if the combined amount of RACM to be stripped, removed, dislodged, cut, drilled, or similarly disturbed is

(i) At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components, or

(ii) At least 1 cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously.

(iii) To determine whether paragraph (a)(4) of this section applies to planned renovation operations involving individual nonscheduled operations, predict the combined additive amount of RACM to be removed or stripped during a calendar year of January 1 through December 31.

(iv) To determine whether paragraph (a)(4) of this section applies to emergency renovation operations, estimate the combined amount of RACM to be removed or stripped as a result of the sudden, unexpected event that necessitated the renovation.

(5) Owners or operators of demolition and renovation operations are exempt from the requirements of §§61.05(a), 61.07, and 61.09.

(b) *Notification requirements.* Each owner or operator of a demolition or renovation activity to which this section applies shall:

(1) Provide the Administrator with written notice of intention to demolish or renovate. Delivery of the notice by U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.

(2) Update notice, as necessary, including when the amount of asbestos affected changes by at least 20 percent.

(3) Postmark or deliver the notice as follows:

(i) At least 10 working days before asbestos stripping or removal work or any other activity begins (such as site preparation that would break up, dislodge or similarly disturb asbestos material), if the operation is described in paragraphs (a) (1) and (4) (except (a)(4)(iii) and (a)(4)(iv)) of this section. If the operation is as described in paragraph (a)(2) of this section, notification is required 10 working days before demolition begins.

(ii) At least 10 working days before the end of the calendar year preceding the year for which notice is being given for renovations described in paragraph (a)(4)(iii) of this section.

(iii) As early as possible before, but not later than, the following working day if the operation is a demolition ordered according to paragraph (a)(3) of this section or, if the operation is a renovation described in paragraph (a)(4)(iv) of this section.

(iv) For asbestos stripping or removal work in a demolition or renovation operation, described in paragraphs (a) (1) and (4) (except (a)(4)(iii) and (a)(4)(iv)) of this section, and for a demolition described in paragraph (a)(2) of this section, that will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator as follows:

(A) When the asbestos stripping or removal operation or demolition operation covered by this paragraph will begin after the date contained in the notice,

(1) Notify the Administrator of the new start date by telephone as soon as possible before the original start date, and

(2) Provide the Administrator with a written notice of the new start date as soon as possible before, and no later than, the original start date. Delivery of the updated notice by the U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.

(B) When the asbestos stripping or removal operation or demolition operation covered by this paragraph will begin on a date earlier than the original start date,

(1) Provide the Administrator with a written notice of the new start date at least 10 working days before asbestos stripping or removal work begins.

(2) For demolitions covered by paragraph (a)(2) of this section, provide the Administrator written notice of a new start date at least 10 working days before commencement of demolition. Delivery of updated notice by U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.

(C) In no event shall an operation covered by this paragraph begin on a date other than the date contained in the written notice of the new start date.

(4) Include the following in the notice:

(i) An indication of whether the notice is the original or a revised notification.

(ii) Name, address, and telephone number of both the facility owner and operator and the asbestos removal contractor owner or operator.

(iii) Type of operation: demolition or renovation.

(iv) Description of the facility or affected part of the facility including the size (square meters [square feet] and number of floors), age, and present and prior use of the facility.

(v) Procedure, including analytical methods, employed to detect the presence of RACM and Category I and Category II nonfriable ACM.

(vi) Estimate of the approximate amount of RACM to be removed from the facility in terms of length of pipe in linear meters (linear feet), surface area in square meters (square feet) on other facility

components, or volume in cubic meters (cubic feet) if off the facility components. Also, estimate the approximate amount of Category I and Category II nonfriable ACM in the affected part of the facility that will not be removed before demolition.

(vii) Location and street address (including building number or name and floor or room number, if appropriate), city, county, and state, of the facility being demolished or renovated.

(viii) Scheduled starting and completion dates of asbestos removal work (or any other activity, such as site preparation that would break up, dislodge, or similarly disturb asbestos material) in a demolition or renovation; planned renovation operations involving individual nonscheduled operations shall only include the beginning and ending dates of the report period as described in paragraph (a)(4)(iii) of this section.

(ix) Scheduled starting and completion dates of demolition or renovation.

(x) Description of planned demolition or renovation work to be performed and method(s) to be employed, including demolition or renovation techniques to be used and description of affected facility components.

(xi) Description of work practices and engineering controls to be used to comply with the requirements of this subpart, including asbestos removal and waste-handling emission control procedures.

(xii) Name and location of the waste disposal site where the asbestos-containing waste material will be deposited.

(xiii) A certification that at least one person trained as required by paragraph (c)(8) of this section will supervise the stripping and removal described by this notification. This requirement shall become effective 1 year after promulgation of this regulation.

(xiv) For facilities described in paragraph (a)(3) of this section, the name, title, and authority of the State or local government representative who has ordered the demolition, the date that the order was issued, and the date on which the demolition was ordered to begin. A copy of the order shall be attached to the notification.

(xv) For emergency renovations described in paragraph (a)(4)(iv) of this section, the date and hour that the emergency occurred, a description of the sudden, unexpected event, and an explanation of how the event caused an unsafe condition, or would cause equipment damage or an unreasonable financial burden.

(xvi) Description of procedures to be followed in the event that unexpected RACM is found or Category II nonfriable ACM becomes crumbled, pulverized, or reduced to powder.

(xvii) Name, address, and telephone number of the waste transporter.

(5) The information required in paragraph (b)(4) of this section must be reported using a form similar to that shown in Figure 3.

(c) *Procedures for asbestos emission control.* Each owner or operator of a demolition or renovation activity to whom this paragraph applies, according to paragraph (a) of this section, shall comply with the following procedures:

(1) Remove all RACM from a facility being demolished or renovated before any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal. RACM need not be removed before demolition if:

(i) It is Category I nonfriable ACM that is not in poor condition and is not friable.

(ii) It is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition; or

(iii) It was not accessible for testing and was, therefore, not discovered until after demolition began and, as a result of the demolition, the material cannot be safely removed. If not removed for safety reasons, the exposed RACM and any asbestos-contaminated debris must be treated as asbestos-containing waste material and adequately wet at all times until disposed of.

(iv) They are Category II nonfriable ACM and the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition.

(2) When a facility component that contains, is covered with, or is coated with RACM is being taken out of the facility as a unit or in sections:

(i) Adequately wet all RACM exposed during cutting or disjoining operations; and

(ii) Carefully lower each unit or section to the floor and to ground level, not dropping, throwing, sliding, or otherwise damaging or disturbing the RACM.

(3) When RACM is stripped from a facility component while it remains in place in the facility, adequately wet the RACM during the stripping operation.

(i) In renovation operations, wetting is not required if:

(A) The owner or operator has obtained prior written approval from the Administrator based on a written application that wetting to comply with this paragraph would unavoidably damage equipment or present a safety hazard; and

(B) The owner or operator uses one of the following emission control methods:

(1) A local exhaust ventilation and collection system designed and operated to capture the particulate asbestos material produced by the stripping and removal of the asbestos materials. The system must exhibit no visible emissions to the outside air or be designed and operated in accordance with the requirements in §61.152.

(2) A glove-bag system designed and operated to contain the particulate asbestos material produced by the stripping of the asbestos materials.

(3) Leak-tight wrapping to contain all RACM prior to dismantlement.

(ii) In renovation operations where wetting would result in equipment damage or a safety hazard, and the methods allowed in paragraph (c)(3)(i) of this section cannot be used, another method may be used after obtaining written approval from the Administrator based upon a determination that it is equivalent to wetting in controlling emissions or to the methods allowed in paragraph (c)(3)(i) of this section.

(iii) A copy of the Administrator's written approval shall be kept at the worksite and made available for inspection.

(4) After a facility component covered with, coated with, or containing RACM has been taken out of the facility as a unit or in sections pursuant to paragraph (c)(2) of this section, it shall be stripped or contained in leak-tight wrapping, except as described in paragraph (c)(5) of this section. If stripped, either:

(i) Adequately wet the RACM during stripping; or

(ii) Use a local exhaust ventilation and collection system designed and operated to capture the particulate asbestos material produced by the stripping. The system must exhibit no visible emissions to the outside air or be designed and operated in accordance with the requirements in §61.152.

(5) For large facility components such as reactor vessels, large tanks, and steam generators, but not beams (which must be handled in accordance with paragraphs (c)(2), (3), and (4) of this section), the RACM is not required to be stripped if the following requirements are met:

(i) The component is removed, transported, stored, disposed of, or reused without disturbing or damaging the RACM.

(ii) The component is encased in a leak-tight wrapping.

(iii) The leak-tight wrapping is labeled according to §61.149(d)(1)(i), (ii), and (iii) during all loading and unloading operations and during storage.

(6) For all RACM, including material that has been removed or stripped:

(i) Adequately wet the material and ensure that it remains wet until collected and contained or treated in preparation for disposal in accordance with §61.150; and

(ii) Carefully lower the material to the ground and floor, not dropping, throwing, sliding, or otherwise damaging or disturbing the material.

(iii) Transport the material to the ground via leak-tight chutes or containers if it has been removed or stripped more than 50 feet above ground level and was not removed as units or in sections.

(iv) RACM contained in leak-tight wrapping that has been removed in accordance with paragraphs (c)(4) and (c)(3)(i)(B)(3) of this section need not be wetted.

(7) When the temperature at the point of wetting is below 0 °C (32 °F):

(i) The owner or operator need not comply with paragraph (c)(2)(i) and the wetting provisions of paragraph (c)(3) of this section.

(ii) The owner or operator shall remove facility components containing, coated with, or covered with RACM as units or in sections to the maximum extent possible.

(iii) During periods when wetting operations are suspended due to freezing temperatures, the owner or operator must record the temperature in the area containing the facility components at the beginning, middle, and end of each workday and keep daily temperature records available for inspection by the Administrator during normal business hours at the demolition or renovation site. The owner or operator shall retain the temperature records for at least 2 years.

(8) Effective 1 year after promulgation of this regulation, no RACM shall be stripped, removed, or otherwise handled or disturbed at a facility regulated by this section unless at least one on-site representative, such as a foreman or management-level person or other authorized representative, trained in the provisions of this regulation and the means of complying with them, is present. Every 2 years, the trained on-site individual shall receive refresher training in the provisions of this regulation. The required training shall include as a minimum: applicability; notifications; material identification; control procedures for removals including, at least, wetting, local exhaust ventilation, negative pressure enclosures, glove-bag procedures, and High Efficiency Particulate Air (HEPA) filters; waste disposal work practices; reporting and recordkeeping; and asbestos hazards and worker protection. Evidence that the required training has been completed shall be posted and made available for inspection by the Administrator at the demolition or renovation site.

(9) For facilities described in paragraph (a)(3) of this section, adequately wet the portion of the facility that contains RACM during the wrecking operation.

(10) If a facility is demolished by intentional burning, all RACM including Category I and Category II nonfriable ACM must be removed in accordance with the NESHAP before burning.

Subpart M—National Emission Standard for Asbestos

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Authority: 42 U.S.C. 7401, 7412, 7414, 7416, 7601.

Source: 49 FR 13661, Apr. 5, 1984, unless otherwise noted.

§ 61.140 Applicability.

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The provisions of this subpart are applicable to those sources specified in §§61.142 through 61.151, 61.154, and 61.155.

[55 FR 48414, Nov. 20, 1990]

§ 61.141 Definitions.

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All terms that are used in this subpart and are not defined below are given the same meaning as in the Act and in subpart A of this part.

Active waste disposal site means any disposal site other than an inactive site.

Adequately wet means sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.

Asbestos means the asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite.

Asbestos-containing waste materials means mill tailings or any waste that contains commercial asbestos and is generated by a source subject to the provisions of this subpart. This term includes filters from control devices, friable asbestos waste material, and bags or other similar packaging contaminated with commercial asbestos. As applied to demolition and renovation operations, this term also includes regulated asbestos-containing material waste and materials contaminated with asbestos including disposable equipment and clothing.

Asbestos mill means any facility engaged in converting, or in any intermediate step in converting, asbestos ore into commercial asbestos. Outside storage of asbestos material is not considered a part of the asbestos mill.

Asbestos tailings means any solid waste that contains asbestos and is a product of asbestos mining or milling operations.

Asbestos waste from control devices means any waste material that contains asbestos and is collected by a pollution control device.

Category I nonfriable asbestos-containing material (ACM) means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy.

Category II nonfriable ACM means any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Commercial asbestos means any material containing asbestos that is extracted from ore and has value because of its asbestos content.

Cutting means to penetrate with a sharp-edged instrument and includes sawing, but does not include shearing, slicing, or punching.

Demolition means the wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.

Emergency renovation operation means a renovation operation that was not planned but results from a sudden, unexpected event that, if not immediately attended to, presents a safety or public health hazard, is necessary to protect equipment from damage, or is necessary to avoid imposing an unreasonable financial burden. This term includes operations necessitated by nonroutine failures of equipment.

Fabricating means any processing (*e.g.*, cutting, sawing, drilling) of a manufactured product that contains commercial asbestos, with the exception of processing at temporary sites (field fabricating) for the construction or restoration of facilities. In the case of friction products, fabricating includes bonding, debonding, grinding, sawing, drilling, or other similar operations performed as part of fabricating.

Facility means any institutional, commercial, public, industrial, or residential structure, installation, or building (including any structure, installation, or building containing condominiums or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; and any active or inactive waste disposal site. For purposes of this definition, any building, structure, or installation that contains a loft used as a dwelling is not considered a residential structure, installation, or building. Any structure, installation or building that

was previously subject to this subpart is not excluded, regardless of its current use or function.

Facility component means any part of a facility including equipment.

Friable asbestos material means any material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.

Fugitive source means any source of emissions not controlled by an air pollution control device.

Glove bag means a sealed compartment with attached inner gloves used for the handling of asbestos-containing materials. Properly installed and used, glove bags provide a small work area enclosure typically used for small-scale asbestos stripping operations. Information on glove-bag installation, equipment and supplies, and work practices is contained in the Occupational Safety and Health Administration's (OSHA's) final rule on occupational exposure to asbestos (appendix G to 29 CFR 1926.58).

Grinding means to reduce to powder or small fragments and includes mechanical chipping or drilling.

In poor condition means the binding of the material is losing its integrity as indicated by peeling, cracking, or crumbling of the material.

Inactive waste disposal site means any disposal site or portion of it where additional asbestos-containing waste material has not been deposited within the past year.

Installation means any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under common control).

Leak-tight means that solids or liquids cannot escape or spill out. It also means dust-tight.

Malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner so that emissions of asbestos are increased. Failures of equipment shall not be considered malfunctions if they are caused in any way by poor maintenance, careless operation, or any other preventable upset conditions, equipment breakdown, or process failure.

Manufacturing means the combining of commercial asbestos—or, in the case of woven friction products, the combining of textiles containing commercial asbestos—with any

other material(s), including commercial asbestos, and the processing of this combination into a product. Chlorine production is considered a part of manufacturing.

Natural barrier means a natural object that effectively precludes or deters access. Natural barriers include physical obstacles such as cliffs, lakes or other large bodies of water, deep and wide ravines, and mountains. Remoteness by itself is not a natural barrier.

Nonfriable asbestos-containing material means any material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Nonscheduled renovation operation means a renovation operation necessitated by the routine failure of equipment, which is expected to occur within a given period based on past operating experience, but for which an exact date cannot be predicted.

Outside air means the air outside buildings and structures, including, but not limited to, the air under a bridge or in an open air ferry dock.

Owner or operator of a demolition or renovation activity means any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

Particulate asbestos material means finely divided particles of asbestos or material containing asbestos.

Planned renovation operations means a renovation operation, or a number of such operations, in which some RACM will be removed or stripped within a given period of time and that can be predicted. Individual nonscheduled operations are included if a number of such operations can be predicted to occur during a given period of time based on operating experience.

Regulated asbestos-containing material (RACM) means (a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.

Remove means to take out RACM or facility components that contain or are covered with RACM from any facility.

Renovation means altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load-supporting structural members are wrecked or taken out are demolitions.

Resilient floor covering means asbestos-containing floor tile, including asphalt and vinyl floor tile, and sheet vinyl floor covering containing more than 1 percent asbestos as determined using polarized light microscopy according to the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy.

Roadways means surfaces on which vehicles travel. This term includes public and private highways, roads, streets, parking areas, and driveways.

Strip means to take off RACM from any part of a facility or facility components.

Structural member means any load-supporting member of a facility, such as beams and load supporting walls; or any nonload-supporting member, such as ceilings and nonload-supporting walls.

Visible emissions means any emissions, which are visually detectable without the aid of instruments, coming from RACM or asbestos-containing waste material, or from any asbestos milling, manufacturing, or fabricating operation. This does not include condensed, uncombined water vapor.

Waste generator means any owner or operator of a source covered by this subpart whose act or process produces asbestos-containing waste material.

Waste shipment record means the shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

Working day means Monday through Friday and includes holidays that fall on any of the days Monday through Friday.

[49 FR 13661, Apr. 5, 1984; 49 FR 25453, June 21, 1984, as amended by 55 FR 48414, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991; 60 FR 31920, June 19, 1995]

§ 61.142 Standard for asbestos mills.

[↑ top](#)

(a) Each owner or operator of an asbestos mill shall either discharge no visible emissions to the outside air from that asbestos mill, including fugitive sources, or use the methods specified by §61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(b) Each owner or operator of an asbestos mill shall meet the following requirements:

(1) Monitor each potential source of asbestos emissions from any part of the mill facility, including air cleaning devices, process equipment, and buildings that house equipment for material processing and handling, at least once each day, during daylight hours, for

visible emissions to the outside air during periods of operation. The monitoring shall be by visual observation of at least 15 seconds duration per source of emissions.

(2) Inspect each air cleaning device at least once each week for proper operation and for changes that signal the potential for malfunction, including, to the maximum extent possible without dismantling other than opening the device, the presence of tears, holes, and abrasions in filter bags and for dust deposits on the clean side of bags. For air cleaning devices that cannot be inspected on a weekly basis according to this paragraph, submit to the Administrator, and revise as necessary, a written maintenance plan to include, at a minimum, the following:

(i) Maintenance schedule.

(ii) Recordkeeping plan.

(3) Maintain records of the results of visible emissions monitoring and air cleaning device inspections using a format similar to that shown in Figures 1 and 2 and include the following:

(i) Date and time of each inspection.

(ii) Presence or absence of visible emissions.

(iii) Condition of fabric filters, including presence of any tears, holes, and abrasions.

(iv) Presence of dust deposits on clean side of fabric filters.

(v) Brief description of corrective actions taken, including date and time.

(vi) Daily hours of operation for each air cleaning device.

(4) Furnish upon request, and make available at the affected facility during normal business hours for inspection by the Administrator, all records required under this section.

(5) Retain a copy of all monitoring and inspection records for at least 2 years.

(6) Submit semiannually a copy of visible emission monitoring records to the Administrator if visible emissions occurred during the report period. Semiannual reports shall be postmarked by the 30th day following the end of the six-month period.

Date of inspection (mo/day/yr)	Time of inspection (a.m./p.m.)	Air cleaning device or fugitive source designation or number	Visible emissions observed (yes/no), corrective action taken	Daily operating hours	Inspector's initials

Figure 1. Record of Visible Emission Monitoring

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1. Air cleaning device designation or number	_____	_____	_____	_____
2. Date of inspection	_____	_____	_____	_____
3. Time of inspection	_____	_____	_____	_____
4. Is air cleaning device operating properly (yes/no)	_____	_____	_____	_____
5. Tears, holes, or abrasions in fabric filter (yes/no)	_____	_____	_____	_____
6. Dust on clean side of fabric filters (yes/no)	_____	_____	_____	_____
7. Other signs of malfunctions or potential malfunctions (yes/no)	_____	_____	_____	_____
8. Describe other malfunctions or signs of potential malfunctions.	_____			

9. Describe corrective action(s) taken.	_____			

10. Date and time corrective action taken	_____	_____	_____	_____
11. Inspected by	_____			
	_____	_____	_____	_____
	(Print/Type Name)	(Title)	(Signature)	(Date)
	_____	_____	_____	_____
	(Print/Type Name)	(Title)	(Signature)	(Date)

Figure 2. Air Cleaning Device Inspection Checklist

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[55 FR 48416, Nov. 20, 1990, as amended at 64 FR 7467, Feb. 12, 1999]

§ 61.143 Standard for roadways.

[↑ top](#)

No person may construct or maintain a roadway with asbestos tailings or asbestos-containing waste material on that roadway, unless, for asbestos tailings.

(a) It is a temporary roadway on an area of asbestos ore deposits (asbestos mine): or

(b) It is a temporary roadway at an active asbestos mill site and is encapsulated with a resinous or bituminous binder. The encapsulated road surface must be maintained at a minimum frequency of once per year to prevent dust emissions; or

(c) It is encapsulated in asphalt concrete meeting the specifications contained in section 401 of Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-85, 1985, or their equivalent.

[55 FR 48419, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991]

§ 61.144 Standard for manufacturing.

[↑ top](#)

(a) *Applicability.* This section applies to the following manufacturing operations using commercial asbestos.

- (1) The manufacture of cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, or other textile materials.
- (2) The manufacture of cement products.
- (3) The manufacture of fireproofing and insulating materials.
- (4) The manufacture of friction products.
- (5) The manufacture of paper, millboard, and felt.
- (6) The manufacture of floor tile.
- (7) The manufacture of paints, coatings, caulks, adhesives, and sealants.
- (8) The manufacture of plastics and rubber materials.
- (9) The manufacture of chlorine utilizing asbestos diaphragm technology.
- (10) The manufacture of shotgun shell wads.
- (11) The manufacture of asphalt concrete.

(b) *Standard.* Each owner or operator of any of the manufacturing operations to which this section applies shall either:

- (1) Discharge no visible emissions to the outside air from these operations or from any building or structure in which they are conducted or from any other fugitive sources; or
- (2) Use the methods specified by §61.152 to clean emissions from these operations containing particulate asbestos material before they escape to, or are vented to, the outside air.
- (3) Monitor each potential source of asbestos emissions from any part of the manufacturing facility, including air cleaning devices, process equipment, and buildings housing material processing and handling equipment, at least once each day during daylight hours for visible emissions to the outside air during periods of operation. The

monitoring shall be by visual observation of at least 15 seconds duration per source of emissions.

(4) Inspect each air cleaning device at least once each week for proper operation and for changes that signal the potential for malfunctions, including, to the maximum extent possible without dismantling other than opening the device, the presence of tears, holes, and abrasions in filter bags and for dust deposits on the clean side of bags. For air cleaning devices that cannot be inspected on a weekly basis according to this paragraph, submit to the Administrator, and revise as necessary, a written maintenance plan to include, at a minimum, the following:

(i) Maintenance schedule.

(ii) Recordkeeping plan.

(5) Maintain records of the results of visible emission monitoring and air cleaning device inspections using a format similar to that shown in Figures 1 and 2 and include the following.

(i) Date and time of each inspection.

(ii) Presence or absence of visible emissions.

(iii) Condition of fabric filters, including presence of any tears, holes and abrasions.

(iv) Presence of dust deposits on clean side of fabric filters.

(v) Brief description of corrective actions taken, including date and time.

(vi) Daily hours of operation for each air cleaning device.

(6) Furnish upon request, and make available at the affected facility during normal business hours for inspection by the Administrator, all records required under this section.

(7) Retain a copy of all monitoring and inspection records for at least 2 years.

(8) Submit semiannually a copy of the visible emission monitoring records to the Administrator if visible emission occurred during the report period. Semiannual reports shall be postmarked by the 30th day following the end of the six-month period.

[49 FR 13661, Apr. 5, 1984, as amended at 55 FR 48419, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991; 64 FR 7467, Feb. 12, 1999]

§ 61.145 Standard for demolition and renovation.

[↑ top](#)

(a) *Applicability.* To determine which requirements of paragraphs (a), (b), and (c) of this section apply to the owner or operator of a demolition or renovation activity and prior to the commencement of the demolition or renovation, thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos, including Category I and Category II nonfriable ACM. The requirements of paragraphs (b) and (c) of this section apply to each owner or operator of a demolition or renovation activity, including the removal of RACM as follows:

(1) In a facility being demolished, all the requirements of paragraphs (b) and (c) of this section apply, except as provided in paragraph (a)(3) of this section, if the combined amount of RACM is

(i) At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components, or

(ii) At least 1 cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously.

(2) In a facility being demolished, only the notification requirements of paragraphs (b)(1), (2), (3)(i) and (iv), and (4)(i) through (vii) and (4)(ix) and (xvi) of this section apply, if the combined amount of RACM is

(i) Less than 80 linear meters (260 linear feet) on pipes and less than 15 square meters (160 square feet) on other facility components, and

(ii) Less than one cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously or there is no asbestos.

(3) If the facility is being demolished under an order of a State or local government agency, issued because the facility is structurally unsound and in danger of imminent collapse, only the requirements of paragraphs (b)(1), (b)(2), (b)(3)(iii), (b)(4) (except (b)(4)(viii)), (b)(5), and (c)(4) through (c)(9) of this section apply.

(4) In a facility being renovated, including any individual nonscheduled renovation operation, all the requirements of paragraphs (b) and (c) of this section apply if the combined amount of RACM to be stripped, removed, dislodged, cut, drilled, or similarly disturbed is

(i) At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components, or

(ii) At least 1 cubic meter (35 cubic feet) off facility components where the length or area could not be measured previously.

(iii) To determine whether paragraph (a)(4) of this section applies to planned renovation operations involving individual nonscheduled operations, predict the combined additive amount of RACM to be removed or stripped during a calendar year of January 1 through December 31.

(iv) To determine whether paragraph (a)(4) of this section applies to emergency renovation operations, estimate the combined amount of RACM to be removed or stripped as a result of the sudden, unexpected event that necessitated the renovation.

(5) Owners or operators of demolition and renovation operations are exempt from the requirements of §§61.05(a), 61.07, and 61.09.

(b) *Notification requirements.* Each owner or operator of a demolition or renovation activity to which this section applies shall:

(1) Provide the Administrator with written notice of intention to demolish or renovate. Delivery of the notice by U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.

(2) Update notice, as necessary, including when the amount of asbestos affected changes by at least 20 percent.

(3) Postmark or deliver the notice as follows:

(i) At least 10 working days before asbestos stripping or removal work or any other activity begins (such as site preparation that would break up, dislodge or similarly disturb asbestos material), if the operation is described in paragraphs (a) (1) and (4) (except (a)(4)(iii) and (a)(4)(iv)) of this section. If the operation is as described in paragraph (a)(2) of this section, notification is required 10 working days before demolition begins.

(ii) At least 10 working days before the end of the calendar year preceding the year for which notice is being given for renovations described in paragraph (a)(4)(iii) of this section.

(iii) As early as possible before, but not later than, the following working day if the operation is a demolition ordered according to paragraph (a)(3) of this section or, if the operation is a renovation described in paragraph (a)(4)(iv) of this section.

(iv) For asbestos stripping or removal work in a demolition or renovation operation, described in paragraphs (a) (1) and (4) (except (a)(4)(iii) and (a)(4)(iv)) of this section, and for a demolition described in paragraph (a)(2) of this section, that will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator as follows:

(A) When the asbestos stripping or removal operation or demolition operation covered by this paragraph will begin after the date contained in the notice,

(1) Notify the Administrator of the new start date by telephone as soon as possible before the original start date, and

(2) Provide the Administrator with a written notice of the new start date as soon as possible before, and no later than, the original start date. Delivery of the updated notice by the U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.

(B) When the asbestos stripping or removal operation or demolition operation covered by this paragraph will begin on a date earlier than the original start date,

(1) Provide the Administrator with a written notice of the new start date at least 10 working days before asbestos stripping or removal work begins.

(2) For demolitions covered by paragraph (a)(2) of this section, provide the Administrator written notice of a new start date at least 10 working days before commencement of demolition. Delivery of updated notice by U.S. Postal Service, commercial delivery service, or hand delivery is acceptable.

(C) In no event shall an operation covered by this paragraph begin on a date other than the date contained in the written notice of the new start date.

(4) Include the following in the notice:

(i) An indication of whether the notice is the original or a revised notification.

(ii) Name, address, and telephone number of both the facility owner and operator and the asbestos removal contractor owner or operator.

(iii) Type of operation: demolition or renovation.

(iv) Description of the facility or affected part of the facility including the size (square meters [square feet] and number of floors), age, and present and prior use of the facility.

(v) Procedure, including analytical methods, employed to detect the presence of RACM and Category I and Category II nonfriable ACM.

(vi) Estimate of the approximate amount of RACM to be removed from the facility in terms of length of pipe in linear meters (linear feet), surface area in square meters (square feet) on other facility components, or volume in cubic meters (cubic feet) if off the facility components. Also, estimate the approximate amount of Category I and Category II nonfriable ACM in the affected part of the facility that will not be removed before demolition.

(vii) Location and street address (including building number or name and floor or room number, if appropriate), city, county, and state, of the facility being demolished or renovated.

(viii) Scheduled starting and completion dates of asbestos removal work (or any other activity, such as site preparation that would break up, dislodge, or similarly disturb asbestos material) in a demolition or renovation; planned renovation operations involving individual nonscheduled operations shall only include the beginning and ending dates of the report period as described in paragraph (a)(4)(iii) of this section.

(ix) Scheduled starting and completion dates of demolition or renovation.

(x) Description of planned demolition or renovation work to be performed and method(s) to be employed, including demolition or renovation techniques to be used and description of affected facility components.

(xi) Description of work practices and engineering controls to be used to comply with the requirements of this subpart, including asbestos removal and waste-handling emission control procedures.

(xii) Name and location of the waste disposal site where the asbestos-containing waste material will be deposited.

(xiii) A certification that at least one person trained as required by paragraph (c)(8) of this section will supervise the stripping and removal described by this notification. This requirement shall become effective 1 year after promulgation of this regulation.

(xiv) For facilities described in paragraph (a)(3) of this section, the name, title, and authority of the State or local government representative who has ordered the demolition, the date that the order was issued, and the date on which the demolition was ordered to begin. A copy of the order shall be attached to the notification.

(xv) For emergency renovations described in paragraph (a)(4)(iv) of this section, the date and hour that the emergency occurred, a description of the sudden, unexpected event, and an explanation of how the event caused an unsafe condition, or would cause equipment damage or an unreasonable financial burden.

(xvi) Description of procedures to be followed in the event that unexpected RACM is found or Category II nonfriable ACM becomes crumbled, pulverized, or reduced to powder.

(xvii) Name, address, and telephone number of the waste transporter.

(5) The information required in paragraph (b)(4) of this section must be reported using a form similar to that shown in Figure 3.

(c) *Procedures for asbestos emission control.* Each owner or operator of a demolition or renovation activity to whom this paragraph applies, according to paragraph (a) of this section, shall comply with the following procedures:

(1) Remove all RACM from a facility being demolished or renovated before any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal. RACM need not be removed before demolition if:

(i) It is Category I nonfriable ACM that is not in poor condition and is not friable.

(ii) It is on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition; or

(iii) It was not accessible for testing and was, therefore, not discovered until after demolition began and, as a result of the demolition, the material cannot be safely removed. If not removed for safety reasons, the exposed RACM and any asbestos-contaminated debris must be treated as asbestos-containing waste material and adequately wet at all times until disposed of.

(iv) They are Category II nonfriable ACM and the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition.

(2) When a facility component that contains, is covered with, or is coated with RACM is being taken out of the facility as a unit or in sections:

(i) Adequately wet all RACM exposed during cutting or disjoining operations; and

(ii) Carefully lower each unit or section to the floor and to ground level, not dropping, throwing, sliding, or otherwise damaging or disturbing the RACM.

(3) When RACM is stripped from a facility component while it remains in place in the facility, adequately wet the RACM during the stripping operation.

(i) In renovation operations, wetting is not required if:

(A) The owner or operator has obtained prior written approval from the Administrator based on a written application that wetting to comply with this paragraph would unavoidably damage equipment or present a safety hazard; and

(B) The owner or operator uses one of the following emission control methods:

(1) A local exhaust ventilation and collection system designed and operated to capture the particulate asbestos material produced by the stripping and removal of the asbestos materials. The system must exhibit no visible emissions to the outside air or be designed and operated in accordance with the requirements in §61.152.

(2) A glove-bag system designed and operated to contain the particulate asbestos material produced by the stripping of the asbestos materials.

(3) Leak-tight wrapping to contain all RACM prior to dismantlement.

(ii) In renovation operations where wetting would result in equipment damage or a safety hazard, and the methods allowed in paragraph (c)(3)(i) of this section cannot be used, another method may be used after obtaining written approval from the Administrator based upon a determination that it is equivalent to wetting in controlling emissions or to the methods allowed in paragraph (c)(3)(i) of this section.

(iii) A copy of the Administrator's written approval shall be kept at the worksite and made available for inspection.

(4) After a facility component covered with, coated with, or containing RACM has been taken out of the facility as a unit or in sections pursuant to paragraph (c)(2) of this section, it shall be stripped or contained in leak-tight wrapping, except as described in paragraph (c)(5) of this section. If stripped, either:

(i) Adequately wet the RACM during stripping; or

(ii) Use a local exhaust ventilation and collection system designed and operated to capture the particulate asbestos material produced by the stripping. The system must exhibit no visible emissions to the outside air or be designed and operated in accordance with the requirements in §61.152.

(5) For large facility components such as reactor vessels, large tanks, and steam generators, but not beams (which must be handled in accordance with paragraphs (c)(2), (3), and (4) of this section), the RACM is not required to be stripped if the following requirements are met:

(i) The component is removed, transported, stored, disposed of, or reused without disturbing or damaging the RACM.

(ii) The component is encased in a leak-tight wrapping.

(iii) The leak-tight wrapping is labeled according to §61.149(d)(1)(i), (ii), and (iii) during all loading and unloading operations and during storage.

(6) For all RACM, including material that has been removed or stripped:

(i) Adequately wet the material and ensure that it remains wet until collected and contained or treated in preparation for disposal in accordance with §61.150; and

(ii) Carefully lower the material to the ground and floor, not dropping, throwing, sliding, or otherwise damaging or disturbing the material.

(iii) Transport the material to the ground via leak-tight chutes or containers if it has been removed or stripped more than 50 feet above ground level and was not removed as units or in sections.

(iv) RACM contained in leak-tight wrapping that has been removed in accordance with paragraphs (c)(4) and (c)(3)(i)(B)(3) of this section need not be wetted.

(7) When the temperature at the point of wetting is below 0 °C (32 °F):

(i) The owner or operator need not comply with paragraph (c)(2)(i) and the wetting provisions of paragraph (c)(3) of this section.

(ii) The owner or operator shall remove facility components containing, coated with, or covered with RACM as units or in sections to the maximum extent possible.

(iii) During periods when wetting operations are suspended due to freezing temperatures, the owner or operator must record the temperature in the area containing the facility components at the beginning, middle, and end of each workday and keep daily temperature records available for inspection by the Administrator during normal business hours at the demolition or renovation site. The owner or operator shall retain the temperature records for at least 2 years.

(8) Effective 1 year after promulgation of this regulation, no RACM shall be stripped, removed, or otherwise handled or disturbed at a facility regulated by this section unless at least one on-site representative, such as a foreman or management-level person or other authorized representative, trained in the provisions of this regulation and the means of complying with them, is present. Every 2 years, the trained on-site individual shall receive refresher training in the provisions of this regulation. The required training shall include as a minimum: applicability; notifications; material identification; control procedures for removals including, at least, wetting, local exhaust ventilation, negative pressure enclosures, glove-bag procedures, and High Efficiency Particulate Air (HEPA) filters; waste disposal work practices; reporting and recordkeeping; and asbestos hazards and worker protection. Evidence that the required training has been completed shall be posted and made available for inspection by the Administrator at the demolition or renovation site.

(9) For facilities described in paragraph (a)(3) of this section, adequately wet the portion of the facility that contains RACM during the wrecking operation.

(10) If a facility is demolished by intentional burning, all RACM including Category I and Category II nonfriable ACM must be removed in accordance with the NESHAP before burning.

NOTIFICATION OF DEMOLITION AND RENOVATION

Operator Project #	Postmark	Date Received	Notification #	
I. TYPE OF NOTIFICATION (C-Original B-Revised C-Cancelled)				
II. FACILITY INFORMATION (Identify owner, removal contractor, and other operator)				
OWNER NAME:				
Address:				
City:	State:	Zip:		
Contact:		Tel:		
REMOVAL CONTRACTOR:				
Address:				
City:	State:	Zip:		
Contact:		Tel:		
OTHER OPERATOR:				
Address:				
City:	State:	Zip:		
Contact:		Tel:		
III. TYPE OF OPERATION (D-Demo D-Demolished Demo R-Renovation R-Other Renovation)				
IV. IS ASBESTOS PRESENT? (Yes/No)				
V. FACILITY DESCRIPTION (Include building name, number and floor or room number)				
Site Name:				
Address:				
City:	State:	County:		
Site Location:				
Building Size:	# of Floors:	Age in Years:		
Present Use:	Prior Use:			
VI. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL:				
VII. APPROXIMATE AMOUNT OF ASBESTOS, INCLUDING:				
1. Population ACM to be removed	SACM TO BE REMOVED	Nonfriable Asbestos Material Not To Be Removed		Indicate Unit of Measurement Below
2. Category I ACM Not Removed		Cat I	Cat II	
3. Category II ACM Not Removed				UNIT
Pipes				SqFt/ Lb Wt
Surface Area				SqFt/ Sq Wt
Other ACM Off Facility Component				CuFt/ Cu Wt
VIII. SCHEDULED DATES ASBESTOS REMOVAL (MM/DD/YY) Starts: Complete:				
IX. SCHEDULED DATES DEMO/RENOVATION (MM/DD/YY) Starts: Complete:				

Continued on page two

Figure 3. Notification of Demolition and Renovation

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NOTIFICATION OF DEMOLITION AND RENOVATION (cont.)		
X. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK, AND METHOD(S) TO BE USED:		
XI. DESCRIPTION OF WORK PRACTICES AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF ASBESTOS AT THE DEMOLITION AND RENOVATION SITE:		
XII. WASTE TRANSPORTER #1		
Name:		
Address:		
City:	State:	Zip:
Contact Person:	Telephone:	
WASTE TRANSPORTER #2		
Name:		
Address:		
City:	State:	Zip:
Contact Person:	Telephone:	
XIII. WASTE DISPOSAL SITE		
Name:		
Location:		
City:	State:	Zip:
Telephone:		
XIV. IF DEMOLITION ORDERED BY A GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW:		
Name:	Title:	
Authority:		
Date of Order (MM/DD/YY):	Date Ordered to Begin (MM/DD/YY):	
XV. FOR EMERGENCY RENOVATIONS		
Date and Hour of Emergency (MM/DD/YY):		
Description of the sudden, unexpected event:		
Explanation of how the event created unsafe conditions or would cause equipment damage to an unreasonable financial burden:		
XVI. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NONFRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, FULVERIZED, OR REDUCED TO POWDER.		
XVI. I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF THIS REGULATION (40 CFR PART 61, SUBPART M) WILL BE ON-SITE DURING THE DEMOLITION OR RENOVATION AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS. (Required 1 year after promulgation)		
_____ (Signature of Owner/Operator)		_____ (Date)
XVII. I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT.		
_____ (Signature of Owner/Operator)		_____ (Date)

Figure 3. Notification of Demolition and Renovation

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[55 FR 48419, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991]

§ 61.146 Standard for spraying.

[↑ top](#)

The owner or operator of an operation in which asbestos-containing materials are spray applied shall comply with the following requirements:

- (a) For spray-on application on buildings, structures, pipes, and conduits, do not use material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy, except as provided in paragraph (c) of this section.
- (b) For spray-on application of materials that contain more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy, on equipment and machinery, except as provided in paragraph (c) of this section:

(1) Notify the Administrator at least 20 days before beginning the spraying operation. Include the following information in the notice:

(i) Name and address of owner or operator.

(ii) Location of spraying operation.

(iii) Procedures to be followed to meet the requirements of this paragraph.

(2) Discharge no visible emissions to the outside air from spray-on application of the asbestos-containing material or use the methods specified by §61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(c) The requirements of paragraphs (a) and (b) of this section do not apply to the spray-on application of materials where the asbestos fibers in the materials are encapsulated with a bituminous or resinous binder during spraying and the materials are not friable after drying.

(d) Owners or operators of sources subject to this paragraph are exempt from the requirements of §§61.05(a), 61.07 and 61.09.

[49 FR 13661, Apr. 5, 1984. Redesignated and amended at 55 FR 48424, Nov. 20, 1990; 60 FR 31920, June 19, 1995]

§ 61.147 Standard for fabricating.

[↑ top](#)

(a) *Applicability.* This section applies to the following fabricating operations using commercial asbestos:

(1) The fabrication of cement building products.

(2) The fabrication of friction products, except those operations that primarily install asbestos friction materials on motor vehicles.

(3) The fabrication of cement or silicate board for ventilation hoods; ovens; electrical panels; laboratory furniture, bulkheads, partitions, and ceilings for marine construction; and flow control devices for the molten metal industry.

(b) *Standard.* Each owner or operator of any of the fabricating operations to which this section applies shall either:

(1) Discharge no visible emissions to the outside air from any of the operations or from any building or structure in which they are conducted or from any other fugitive sources; or

(2) Use the methods specified by §61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(3) Monitor each potential source of asbestos emissions from any part of the fabricating facility, including air cleaning devices, process equipment, and buildings that house equipment for material processing and handling, at least once each day, during daylight hours, for visible emissions to the outside air during periods of operation. The monitoring shall be by visual observation of at least 15 seconds duration per source of emissions.

(4) Inspect each air cleaning device at least once each week for proper operation and for changes that signal the potential for malfunctions, including, to the maximum extent possible without dismantling other than opening the device, the presence of tears, holes, and abrasions in filter bags and for dust deposits on the clean side of bags. For air cleaning devices that cannot be inspected on a weekly basis according to this paragraph, submit to the Administrator, and revise as necessary, a written maintenance plan to include, at a minimum, the following:

(i) Maintenance schedule.

(ii) Recordkeeping plan.

(5) Maintain records of the results of visible emission monitoring and air cleaning device inspections using a format similar to that shown in Figures 1 and 2 and include the following:

(i) Date and time of each inspection.

(ii) Presence or absence of visible emissions.

(iii) Condition of fabric filters, including presence of any tears, holes, and abrasions.

(iv) Presence of dust deposits on clean side of fabric filters.

(v) Brief description of corrective actions taken, including date and time.

(vi) Daily hours of operation for each air cleaning device.

(6) Furnish upon request and make available at the affected facility during normal business hours for inspection by the Administrator, all records required under this section.

(7) Retain a copy of all monitoring and inspection records for at least 2 years.

(8) Submit semiannually a copy of the visible emission monitoring records to the Administrator if visible emission occurred during the report period. Semiannual reports shall be postmarked by the 30th day following the end of the six-month period.

[49 FR 13661, Apr. 5, 1984. Redesignated and amended at 55 FR 48424, Nov. 20, 1991; 64 FR 7467, Feb. 12, 1999]

§ 61.148 Standard for insulating materials.

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No owner or operator of a facility may install or reinstall on a facility component any insulating materials that contain commercial asbestos if the materials are either molded and friable or wet-applied and friable after drying. The provisions of this section do not apply to spray-applied insulating materials regulated under §61.146.

[55 FR 48424, Nov. 20, 1990]

§ 61.149 Standard for waste disposal for asbestos mills.

[↑ top](#)

Each owner or operator of any source covered under the provisions of §61.142 shall:

(a) Deposit all asbestos-containing waste material at a waste disposal site operated in accordance with the provisions of §61.154; and

(b) Discharge no visible emissions to the outside air from the transfer of control device asbestos waste to the tailings conveyor, or use the methods specified by §61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air. Dispose of the asbestos waste from control devices in accordance with §61.150(a) or paragraph (c) of this section; and

(c) Discharge no visible emissions to the outside air during the collection, processing, packaging, or on-site transporting of any asbestos-containing waste material, or use one of the disposal methods specified in paragraphs (c) (1) or (2) of this section, as follows:

(1) Use a wetting agent as follows:

(i) Adequately mix all asbestos-containing waste material with a wetting agent recommended by the manufacturer of the agent to effectively wet dust and tailings, before depositing the material at a waste disposal site. Use the agent as recommended for the particular dust by the manufacturer of the agent.

(ii) Discharge no visible emissions to the outside air from the wetting operation or use the methods specified by §61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(iii) Wetting may be suspended when the ambient temperature at the waste disposal site is less than $-9.5\text{ }^{\circ}\text{C}$ ($15\text{ }^{\circ}\text{F}$), as determined by an appropriate measurement method with an accuracy of $\pm 1\text{ }^{\circ}\text{C}$ ($\pm 2\text{ }^{\circ}\text{F}$). During periods when wetting operations are suspended, the temperature must be recorded at least at hourly intervals, and records must be retained for at least 2 years in a form suitable for inspection.

(2) Use an alternative emission control and waste treatment method that has received prior written approval by the Administrator. To obtain approval for an alternative method, a written application must be submitted to the Administrator demonstrating that the following criteria are met:

(i) The alternative method will control asbestos emissions equivalent to currently required methods.

(ii) The suitability of the alternative method for the intended application.

(iii) The alternative method will not violate other regulations.

(iv) The alternative method will not result in increased water pollution, land pollution, or occupational hazards.

(d) When waste is transported by vehicle to a disposal site:

(1) Mark vehicles used to transport asbestos-containing waste material during the loading and unloading of the waste so that the signs are visible. The markings must:

(i) Be displayed in such a manner and location that a person can easily read the legend.

(ii) Conform to the requirements for $51\text{ cm} \times 36\text{ cm}$ ($20\text{ in} \times 14\text{ in}$) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and

(iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

Legend

DANGER

ASBESTOS DUST HAZARD

CANCER AND LUNG DISEASE HAZARD

Authorized Personnel Only

Notation

2.5 cm (1 inch) Sans Serif, Gothic or Block

2.5 cm (1 inch) Sans Serif, Gothic or Block

1.9 cm (3/4inch) Sans Serif, Gothic or Block

14 Point Gothic

Spacing between any two lines must be a least equal to the height of the upper of the two lines.

(2) For off-site disposal, provide a copy of the waste shipment record, described in paragraph (e)(1) of this section, to the disposal site owner or operator at the same time as the asbestos-containing waste material is delivered to the disposal site.

(e) For all asbestos-containing waste material transported off the facility site:

(1) Maintain asbestos waste shipment records, using a form similar to that shown in Figure 4, and include the following information:

(i) The name, address, and telephone number of the waste generator.

(ii) The name and address of the local, State, or EPA Regional agency responsible for administering the asbestos NESHAP program.

(iii) The quantity of the asbestos-containing waste material in cubic meters (cubic yards).

(iv) The name and telephone number of the disposal site operator.

(v) The name and physical site location of the disposal site.

(vi) The date transported.

(vii) The name, address, and telephone number of the transporter(s).

(viii) A certification that the contents of this consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.

(2) For waste shipments where a copy of the waste shipment record, signed by the owner or operator of the designated disposal site, is not received by the waste generator within

35 days of the date the waste was accepted by the initial transporter, contact the transporter and/or the owner or operator of the designated disposal site to determine the status of the waste shipment.

(3) Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator if a copy of the waste shipment record, signed by the owner or operator of the designated waste disposal site, is not received by the waste generator within 45 days of the date the waste was accepted by the initial transporter. Include in the report the following information:

(i) A copy of the waste shipment record for which a confirmation of delivery was not received, and

(ii) A cover letter signed by the waste generator explaining the efforts taken to locate the asbestos waste shipment and the results of those efforts.

(4) Retain a copy of all waste shipment records, including a copy of the waste shipment record signed by the owner or operator of the designated waste disposal site, for at least 2 years.

(f) Furnish upon request, and make available for inspection by the Administrator, all records required under this section.

Generator	1. Work site name and mailing address		Owner's name	Owner's telephone no.
	2. Operator's name and address			Operator's telephone no.
	3. Waste disposal site (WDS) name, mailing address, and physical site location			WDS phone no.
	4. Name, and address of responsible agency			
	5. Description of materials		6. Containers No. Type	7. Total quantity m ³ (yd ³)
	8. Special handling instructions and additional information			
	9. OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.			
	Printed/typed name & title		Signature	Month Day Year
	Transporter	10. Transporter 1 (Acknowledgment of receipt of materials)		
Printed/typed name & title		Signature	Month Day Year	
Address and telephone no.				
11. Transporter 2 (Acknowledgment of receipt of materials)				
Printed/typed name & title		Signature	Month Day Year	
Address and telephone no.				
Disposal Site	12. Discrepancy indication space			
	13. Waste disposal site owner or operator: Certification of receipt of asbestos materials covered by this manifest except as noted in item 12.			
Printed/typed name & title		Signature	Month Day Year	

(Continued)

Figure 4. Waste Shipment Record

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INSTRUCTIONS	
<u>Waste Generator Section (Items 1-9)</u>	
1.	Enter the name of the facility at which asbestos waste is generated and the address where the facility is located. In the appropriate spaces, also enter the name of the owner of the facility and the owner's phone number.
2.	If a demolition or renovation, enter the name and address of the company and authorized agent responsible for performing the asbestos removal. In the appropriate spaces, also enter the phone number of the operator.
3.	Enter the name, address, and physical site location of the waste disposal site (WDS) that will be receiving the asbestos materials. In the appropriate spaces, also enter the phone number of the WDS. Enter "on-site" if the waste will be disposed of on the generator's property.
4.	Provide the name and address of the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program.
5.	Indicate the types of asbestos waste materials generated. If from a demolition or renovation, indicate the amount of asbestos that is <ul style="list-style-type: none">- Friable asbestos material- Nonfriable asbestos material
6.	Enter the number of containers used to transport the asbestos materials listed in Item 5. Also enter one of the following container codes used in transporting each type of asbestos material (specify any other type of container used if not listed below): <ul style="list-style-type: none">DM - Metal drums, barrelsDP - Plastic drums, barrelsBA - 6 mil plastic bags or wrapping
7.	Enter the quantities of each type of asbestos material removed in units of cubic meters (cubic yards).
8.	Use this space to indicate special transportation, treatment, storage or disposal or Bill of Lading information. If an alternate waste disposal site is designated, note it here. Emergency response telephone numbers or similar information may be included here.
9.	The authorized agent of the waste generator must read and then sign and date this certification. The date is the date of receipt by transporter.
NOTE: The waste generator must retain a copy of this form.	

(continued)

Figure 4. Waste Shipment Record

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<u>Transporter Section (Items 10 & 11)</u>	
10. & 11.	Enter name, address, and telephone number of each transporter used, if applicable. Print or type the full name and title of person accepting responsibility and acknowledging receipt of materials as listed on this waste shipment record for transport. Enter date of receipt and signature.
NOTE: The transporter must retain a copy of this form.	
<u>Disposal Site Section (Items 12 & 13)</u>	
12.	The authorized representative of the WDS must note in this space any discrepancy between waste described on this manifest and waste actually received as well as any improperly enclosed or contained waste. Any rejected materials should be listed and destination of those materials provided. A site that converts asbestos-containing waste material to nonasbestos material is considered a WDS.
13.	The signature (by hand) of the authorized WDS agent indicates acceptance and agreement with statements on this manifest except as noted in item 12. The date is the date of signature and receipt of shipment.
NOTE: The WDS must retain a completed copy of this form. The WDS must also send a completed copy to the operator listed in item 2.	

Figure 4. Waste Shipment Record

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§ 61.150 Standard for waste disposal for manufacturing, fabricating, demolition, renovation, and spraying operations.

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Each owner or operator of any source covered under the provisions of §§61.144, 61.145, 61.146, and 61.147 shall comply with the following provisions:

(a) Discharge no visible emissions to the outside air during the collection, processing (including incineration), packaging, or transporting of any asbestos-containing waste material generated by the source, or use one of the emission control and waste treatment methods specified in paragraphs (a) (1) through (4) of this section.

(1) Adequately wet asbestos-containing waste material as follows:

(i) Mix control device asbestos waste to form a slurry; adequately wet other asbestos-containing waste material; and

(ii) Discharge no visible emissions to the outside air from collection, mixing, wetting, and handling operations, or use the methods specified by §61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air; and

(iii) After wetting, seal all asbestos-containing waste material in leak-tight containers while wet; or, for materials that will not fit into containers without additional breaking, put materials into leak-tight wrapping; and

(iv) Label the containers or wrapped materials specified in paragraph (a)(1)(iii) of this section using warning labels specified by Occupational Safety and Health Standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.1001(j)(4) or 1926.1101(k)(8). The labels shall be printed in letters of sufficient size and contrast so as to be readily visible and legible.

(v) For asbestos-containing waste material to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and the location at which the waste was generated.

(2) Process asbestos-containing waste material into nonfriable forms as follows:

(i) Form all asbestos-containing waste material into nonfriable pellets or other shapes;

(ii) Discharge no visible emissions to the outside air from collection and processing operations, including incineration, or use the method specified by §61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(3) For facilities demolished where the RACM is not removed prior to demolition according to §§61.145(c)(1) (i), (ii), (iii), and (iv) or for facilities demolished according to §61.145(c)(9), adequately wet asbestos-containing waste material at all times after demolition and keep wet during handling and loading for transport to a disposal site. Asbestos-containing waste materials covered by this paragraph do not have to be sealed in leak-tight containers or wrapping but may be transported and disposed of in bulk.

(4) Use an alternative emission control and waste treatment method that has received prior approval by the Administrator according to the procedure described in §61.149(c)(2).

(5) As applied to demolition and renovation, the requirements of paragraph (a) of this section do not apply to Category I nonfriable ACM waste and Category II nonfriable ACM waste that did not become crumbled, pulverized, or reduced to powder.

(b) All asbestos-containing waste material shall be deposited as soon as is practical by the waste generator at:

(1) A waste disposal site operated in accordance with the provisions of §61.154, or

(2) An EPA-approved site that converts RACM and asbestos-containing waste material into nonasbestos (asbestos-free) material according to the provisions of §61.155.

(3) The requirements of paragraph (b) of this section do not apply to Category I nonfriable ACM that is not RACM.

(c) Mark vehicles used to transport asbestos-containing waste material during the loading and unloading of waste so that the signs are visible. The markings must conform to the requirements of §§61.149(d)(1) (i), (ii), and (iii).

(d) For all asbestos-containing waste material transported off the facility site:

(1) Maintain waste shipment records, using a form similar to that shown in Figure 4, and include the following information:

(i) The name, address, and telephone number of the waste generator.

(ii) The name and address of the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program.

(iii) The approximate quantity in cubic meters (cubic yards).

(iv) The name and telephone number of the disposal site operator.

(v) The name and physical site location of the disposal site.

(vi) The date transported.

(vii) The name, address, and telephone number of the transporter(s).

(viii) A certification that the contents of this consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.

(2) Provide a copy of the waste shipment record, described in paragraph (d)(1) of this section, to the disposal site owners or operators at the same time as the asbestos-containing waste material is delivered to the disposal site.

(3) For waste shipments where a copy of the waste shipment record, signed by the owner or operator of the designated disposal site, is not received by the waste generator within 35 days of the date the waste was accepted by the initial transporter, contact the transporter and/or the owner or operator of the designated disposal site to determine the status of the waste shipment.

(4) Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator if a copy of the waste shipment record, signed by the owner or operator of the designated waste disposal site, is not received by the waste generator within 45 days of the date the waste was accepted by the initial transporter. Include in the report the following information:

(i) A copy of the waste shipment record for which a confirmation of delivery was not received, and

(ii) A cover letter signed by the waste generator explaining the efforts taken to locate the asbestos waste shipment and the results of those efforts.

(5) Retain a copy of all waste shipment records, including a copy of the waste shipment record signed by the owner or operator of the designated waste disposal site, for at least 2 years.

(e) Furnish upon request, and make available for inspection by the Administrator, all records required under this section.

[55 FR 48429, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991, as amended at 68 FR 54793, Sept. 18, 2003]

§ 61.151 Standard for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations.

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Each owner or operator of any inactive waste disposal site that was operated by sources covered under §61.142, 61.144, or 61.147 and received deposits of asbestos-containing waste material generated by the sources, shall:

(a) Comply with one of the following:

(1) Either discharge no visible emissions to the outside air from an inactive waste disposal site subject to this paragraph; or

(2) Cover the asbestos-containing waste material with at least 15 centimeters (6 inches) of compacted nonasbestos-containing material, and grow and maintain a cover of vegetation on the area adequate to prevent exposure of the asbestos-containing waste material. In desert areas where vegetation would be difficult to maintain, at least 8 additional centimeters (3 inches) of well-graded, nonasbestos crushed rock may be placed on top of the final cover instead of vegetation and maintained to prevent emissions; or

(3) Cover the asbestos-containing waste material with at least 60 centimeters (2 feet) of compacted nonasbestos-containing material, and maintain it to prevent exposure of the asbestos-containing waste; or

(4) For inactive waste disposal sites for asbestos tailings, a resinous or petroleum-based dust suppression agent that effectively binds dust to control surface air emissions may be used instead of the methods in paragraphs (a) (1), (2), and (3) of this section. Use the agent in the manner and frequency recommended for the particular asbestos tailings by the manufacturer of the dust suppression agent to achieve and maintain dust control. Obtain prior written approval of the Administrator to use other equally effective dust suppression agents. For purposes of this paragraph, any used, spent, or other waste oil is not considered a dust suppression agent.

(b) Unless a natural barrier adequately deters access by the general public, install and maintain warning signs and fencing as follows, or comply with paragraph (a)(2) or (a)(3) of this section.

(1) Display warning signs at all entrances and at intervals of 100 m (328 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material was deposited. The warning signs must:

(i) Be posted in such a manner and location that a person can easily read the legend; and

(ii) Conform to the requirements for 51 cm×36 cm (20&inch;×14&inch;) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and

(iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

Legend	Notation
---------------	-----------------

Asbestos Waste Disposal Site	2.5 cm (1 inch) Sans Serif, Gothic or Block
Do Not Create Dust	1.9 cm (3/4 inch) Sans Serif, Gothic or Block
Breathing Asbestos is Hazardous to Your Health	14 Point Gothic.

Spacing between any two lines must be at least equal to the height of the upper of the two lines.

(2) Fence the perimeter of the site in a manner adequate to deter access by the general public.

(3) When requesting a determination on whether a natural barrier adequately deters public access, supply information enabling the Administrator to determine whether a fence or a natural barrier adequately deters access by the general public.

(c) The owner or operator may use an alternative control method that has received prior approval of the Administrator rather than comply with the requirements of paragraph (a) or (b) of this section.

(d) Notify the Administrator in writing at least 45 days prior to excavating or otherwise disturbing any asbestos-containing waste material that has been deposited at a waste disposal site under this section, and follow the procedures specified in the notification. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice:

(1) Scheduled starting and completion dates.

(2) Reason for disturbing the waste.

(3) Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos-containing waste material. If deemed necessary, the Administrator may require changes in the emission control procedures to be used.

(4) Location of any temporary storage site and the final disposal site.

(e) Within 60 days of a site becoming inactive and after the effective date of this subpart, record, in accordance with State law, a notation on the deed to the facility property and on any other instrument that would normally be examined during a title search; this notation will in perpetuity notify any potential purchaser of the property that:

(1) The land has been used for the disposal of asbestos-containing waste material;

(2) The survey plot and record of the location and quantity of asbestos-containing waste disposed of within the disposal site required in §61.154(f) have been filed with the Administrator; and

(3) The site is subject to 40 CFR part 61, subpart M.

[49 FR 13661, Apr. 5, 1984, as amended at 53 FR 36972, Sept. 23, 1988. Redesignated and amended at 55 FR 48429, Nov. 20, 1990]

§ 61.152 Air-cleaning.

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(a) The owner or operator who uses air cleaning, as specified in §§61.142(a), 61.144(b)(2), 61.145(c)(3)(i)(B)(I), 61.145(c)(4)(ii), 61.145(c)(11)(i), 61.146(b)(2), 61.147(b)(2), 61.149(b), 61.149(c)(1)(ii), 61.150(a)(1)(ii), 61.150(a)(2)(ii), and 61.155(e) shall:

(1) Use fabric filter collection devices, except as noted in paragraph (b) of this section, doing all of the following:

(i) Ensuring that the airflow permeability, as determined by ASTM Method D737–75, does not exceed $9 \text{ m}^3 / \text{min}/\text{m}^2$ ($30 \text{ ft}^3 / \text{min}/\text{ft}^2$) for woven fabrics or $11 \text{ m}^3 / \text{min}/\text{m}^2$ ($35 \text{ ft}^3 / \text{min}/\text{ft}^2$) for felted fabrics, except that $12 \text{ m}^3 / \text{min}/\text{m}^2$ ($40 \text{ ft}^3 \text{ min}/\text{ft}^2$) for woven and $14 \text{ m}^3 / \text{min}/\text{m}^2$ ($45 \text{ ft}^3 \text{ min}/\text{ft}^2$) for felted fabrics is allowed for filtering air from asbestos ore dryers; and

(ii) Ensuring that felted fabric weighs at least 475 grams per square meter (14 ounces per square yard) and is at least 1.6 millimeters (one-sixteenth inch) thick throughout; and

(iii) Avoiding the use of synthetic fabrics that contain fill yarn other than that which is spun.

(2) Properly install, use, operate, and maintain all air-cleaning equipment authorized by this section. Bypass devices may be used only during upset or emergency conditions and then only for so long as it takes to shut down the operation generating the particulate asbestos material.

(3) For fabric filter collection devices installed after January 10, 1989, provide for easy inspection for faulty bags.

(b) There are the following exceptions to paragraph (a)(1):

(1) After January 10, 1989, if the use of fabric creates a fire or explosion hazard, or the Administrator determines that a fabric filter is not feasible, the Administrator may

authorize as a substitute the use of wet collectors designed to operate with a unit contacting energy of at least 9.95 kilopascals (40 inches water gage pressure).

(2) Use a HEPA filter that is certified to be at least 99.97 percent efficient for 0.3 micron particles.

(3) The Administrator may authorize the use of filtering equipment other than described in paragraphs (a)(1) and (b)(1) and (2) of this section if the owner or operator demonstrates to the Administrator's satisfaction that it is equivalent to the described equipment in filtering particulate asbestos material.

[49 FR 13661, Apr. 5, 1984; 49 FR 25453, June 21, 1984, as amended at 51 FR 8199, Mar. 10, 1986. Redesignated and amended at 55 FR 48430, Nov. 20, 1990]

§ 61.153 Reporting.

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(a) Any new source to which this subpart applies (with the exception of sources subject to §§61.143, 61.145, 61.146, and 61.148), which has an initial startup date preceding the effective date of this revision, shall provide the following information to the Administrator postmarked or delivered within 90 days of the effective date. In the case of a new source that does not have an initial startup date preceding the effective date, the information shall be provided, postmarked or delivered, within 90 days of the initial startup date. Any owner or operator of an existing source shall provide the following information to the Administrator within 90 days of the effective date of this subpart unless the owner or operator of the existing source has previously provided this information to the Administrator. Any changes in the information provided by any existing source shall be provided to the Administrator, postmarked or delivered, within 30 days after the change.

(1) A description of the emission control equipment used for each process; and

(i) If the fabric device uses a woven fabric, the airflow permeability in $\text{m}^3/\text{min}/\text{m}^2$ and; if the fabric is synthetic, whether the fill yarn is spun or not spun; and

(ii) If the fabric filter device uses a felted fabric, the density in g/m^2 , the minimum thickness in inches, and the airflow permeability in $\text{m}^3/\text{min}/\text{m}^2$.

(2) If a fabric filter device is used to control emissions,

(i) The airflow permeability in $\text{m}^3/\text{min}/\text{m}^2$ ($\text{ft}^3/\text{min}/\text{ft}^2$) if the fabric filter device uses a woven fabric, and, if the fabric is synthetic, whether the fill yarn is spun or not spun; and

(ii) If the fabric filter device uses a felted fabric, the density in g/m^2 (oz/yd^2), the minimum thickness in millimeters (inches), and the airflow permeability in $\text{m}^3/\text{min/m}^2$ ($\text{ft}^3/\text{min/ft}^2$).

(3) If a HEPA filter is used to control emissions, the certified efficiency.

(4) For sources subject to §§61.149 and 61.150:

(i) A brief description of each process that generates asbestos-containing waste material; and

(ii) The average volume of asbestos-containing waste material disposed of, measured in m^3/day (yd^3/day); and

(iii) The emission control methods used in all stages of waste disposal; and

(iv) The type of disposal site or incineration site used for ultimate disposal, the name of the site operator, and the name and location of the disposal site.

(5) For sources subject to §§61.151 and 61.154:

(i) A brief description of the site; and

(ii) The method or methods used to comply with the standard, or alternative procedures to be used.

(b) The information required by paragraph (a) of this section must accompany the information required by §61.10. Active waste disposal sites subject to §61.154 shall also comply with this provision. Roadways, demolition and renovation, spraying, and insulating materials are exempted from the requirements of §61.10(a). The information described in this section must be reported using the format of appendix A of this part as a guide.

(Sec. 114. Clean Air Act as amended (42 U.S.C. 7414))

[49 FR 13661, Apr. 5, 1984. Redesignated and amended at 55 FR 48430, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991]

§ 61.154 Standard for active waste disposal sites.

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Each owner or operator of an active waste disposal site that receives asbestos-containing waste material from a source covered under §61.149, 61.150, or 61.155 shall meet the requirements of this section:

(a) Either there must be no visible emissions to the outside air from any active waste disposal site where asbestos-containing waste material has been deposited, or the requirements of paragraph (c) or (d) of this section must be met.

(b) Unless a natural barrier adequately deters access by the general public, either warning signs and fencing must be installed and maintained as follows, or the requirements of paragraph (c)(1) of this section must be met.

(1) Warning signs must be displayed at all entrances and at intervals of 100 m (330 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material is deposited. The warning signs must:

(i) Be posted in such a manner and location that a person can easily read the legend; and

(ii) Conform to the requirements of 51 cm × 36 cm (20&inch;×14&inch;) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and

(iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

Legend	Notation
Asbestos Waste Disposal Site	2.5 cm (1 inch) Sans Serif, Gothic or Block.
Do Not Create Dust	1.9 cm (3/4 inch) Sans Serif, Gothic or Block.
Breathing Asbestos is Hazardous to Your Health	14 Point Gothic.

Spacing between any two lines must be at least equal to the height of the upper of the two lines.

(2) The perimeter of the disposal site must be fenced in a manner adequate to deter access by the general public.

(3) Upon request and supply of appropriate information, the Administrator will determine whether a fence or a natural barrier adequately deters access by the general public.

(c) Rather than meet the no visible emission requirement of paragraph (a) of this section, at the end of each operating day, or at least once every 24-hour period while the site is in continuous operation, the asbestos-containing waste material that has been deposited at the site during the operating day or previous 24-hour period shall:

(1) Be covered with at least 15 centimeters (6 inches) of compacted nonasbestos-containing material, or

(2) Be covered with a resinous or petroleum-based dust suppression agent that effectively binds dust and controls wind erosion. Such an agent shall be used in the manner and frequency recommended for the particular dust by the dust suppression agent manufacturer to achieve and maintain dust control. Other equally effective dust suppression agents may be used upon prior approval by the Administrator. For purposes of this paragraph, any used, spent, or other waste oil is not considered a dust suppression agent.

(d) Rather than meet the no visible emission requirement of paragraph (a) of this section, use an alternative emissions control method that has received prior written approval by the Administrator according to the procedures described in §61.149(c)(2).

(e) For all asbestos-containing waste material received, the owner or operator of the active waste disposal site shall:

(1) Maintain waste shipment records, using a form similar to that shown in Figure 4, and include the following information:

(i) The name, address, and telephone number of the waste generator.

(ii) The name, address, and telephone number of the transporter(s).

(iii) The quantity of the asbestos-containing waste material in cubic meters (cubic yards).

(iv) The presence of improperly enclosed or uncovered waste, or any asbestos-containing waste material not sealed in leak-tight containers. Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site, by the following working day, the presence of a significant amount of improperly enclosed or uncovered waste. Submit a copy of the waste shipment record along with the report.

(v) The date of the receipt.

(2) As soon as possible and no longer than 30 days after receipt of the waste, send a copy of the signed waste shipment record to the waste generator.

(3) Upon discovering a discrepancy between the quantity of waste designated on the waste shipment records and the quantity actually received, attempt to reconcile the discrepancy with the waste generator. If the discrepancy is not resolved within 15 days after receiving the waste, immediately report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP

program for the disposal site. Describe the discrepancy and attempts to reconcile it, and submit a copy of the waste shipment record along with the report.

(4) Retain a copy of all records and reports required by this paragraph for at least 2 years.

(f) Maintain, until closure, records of the location, depth and area, and quantity in cubic meters (cubic yards) of asbestos-containing waste material within the disposal site on a map or diagram of the disposal area.

(g) Upon closure, comply with all the provisions of §61.151.

(h) Submit to the Administrator, upon closure of the facility, a copy of records of asbestos waste disposal locations and quantities.

(i) Furnish upon request, and make available during normal business hours for inspection by the Administrator, all records required under this section.

(j) Notify the Administrator in writing at least 45 days prior to excavating or otherwise disturbing any asbestos-containing waste material that has been deposited at a waste disposal site and is covered. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice:

(1) Scheduled starting and completion dates.

(2) Reason for disturbing the waste.

(3) Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos-containing waste material. If deemed necessary, the Administrator may require changes in the emission control procedures to be used.

(4) Location of any temporary storage site and the final disposal site.

(Secs. 112 and 301(a) of the Clean Air Act as amended (42 U.S.C. 7412, 7601(a))

[49 FR 13661, Apr. 5, 1990. Redesignated and amended at 55 FR 48431, Nov. 20, 1990; 56 FR 1669, Jan. 16, 1991]

§ 61.155 Standard for operations that convert asbestos-containing waste material into nonasbestos (asbestos-free) material.

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Each owner or operator of an operation that converts RACM and asbestos-containing waste material into nonasbestos (asbestos-free) material shall:

(a) Obtain the prior written approval of the Administrator to construct the facility. To obtain approval, the owner or operator shall provide the Administrator with the following information:

(1) Application to construct pursuant to §61.07.

(2) In addition to the information requirements of §61.07(b)(3), a

(i) Description of waste feed handling and temporary storage.

(ii) Description of process operating conditions.

(iii) Description of the handling and temporary storage of the end product.

(iv) Description of the protocol to be followed when analyzing output materials by transmission electron microscopy.

(3) Performance test protocol, including provisions for obtaining information required under paragraph (b) of this section.

(4) The Administrator may require that a demonstration of the process be performed prior to approval of the application to construct.

(b) Conduct a start-up performance test. Test results shall include:

(1) A detailed description of the types and quantities of nonasbestos material, RACM, and asbestos-containing waste material processed, *e.g.*, asbestos cement products, friable asbestos insulation, plaster, wood, plastic, wire, etc. Test feed is to include the full range of materials that will be encountered in actual operation of the process.

(2) Results of analyses, using polarized light microscopy, that document the asbestos content of the wastes processed.

(3) Results of analyses, using transmission electron microscopy, that document that the output materials are free of asbestos. Samples for analysis are to be collected as 8-hour composite samples (one 200-gram (7-ounce) sample per hour), beginning with the initial introduction of RACM or asbestos-containing waste material and continuing until the end of the performance test.

(4) A description of operating parameters, such as temperature and residence time, defining the full range over which the process is expected to operate to produce nonasbestos (asbestos-free) materials. Specify the limits for each operating parameter within which the process will produce nonasbestos (asbestos-free) materials.

(5) The length of the test.

(c) During the initial 90 days of operation,

(1) Continuously monitor and log the operating parameters identified during start-up performance tests that are intended to ensure the production of nonasbestos (asbestos-free) output material.

(2) Monitor input materials to ensure that they are consistent with the test feed materials described during start-up performance tests in paragraph (b)(1) of this section.

(3) Collect and analyze samples, taken as 10-day composite samples (one 200-gram (7-ounce) sample collected every 8 hours of operation) of all output material for the presence of asbestos. Composite samples may be for fewer than 10 days. Transmission electron microscopy (TEM) shall be used to analyze the output material for the presence of asbestos. During the initial 90-day period, all output materials must be stored on-site until analysis shows the material to be asbestos-free or disposed of as asbestos-containing waste material according to §61.150.

(d) After the initial 90 days of operation,

(1) Continuously monitor and record the operating parameters identified during start-up performance testing and any subsequent performance testing. Any output produced during a period of deviation from the range of operating conditions established to ensure the production of nonasbestos (asbestos-free) output materials shall be:

(i) Disposed of as asbestos-containing waste material according to §61.150, or

(ii) Recycled as waste feed during process operation within the established range of operating conditions, or

(iii) Stored temporarily on-site in a leak-tight container until analyzed for asbestos content. Any product material that is not asbestos-free shall be either disposed of as asbestos-containing waste material or recycled as waste feed to the process.

(2) Collect and analyze monthly composite samples (one 200-gram (7-ounce) sample collected every 8 hours of operation) of the output material. Transmission electron microscopy shall be used to analyze the output material for the presence of asbestos.

(e) Discharge no visible emissions to the outside air from any part of the operation, or use the methods specified by §61.152 to clean emissions containing particulate asbestos material before they escape to, or are vented to, the outside air.

(f) Maintain records on-site and include the following information:

(1) Results of start-up performance testing and all subsequent performance testing, including operating parameters, feed characteristic, and analyses of output materials.

(2) Results of the composite analyses required during the initial 90 days of operation under §61.155(c).

(3) Results of the monthly composite analyses required under §61.155(d).

(4) Results of continuous monitoring and logs of process operating parameters required under §61.155 (c) and (d).

(5) The information on waste shipments received as required in §61.154(e).

(6) For output materials where no analyses were performed to determine the presence of asbestos, record the name and location of the purchaser or disposal site to which the output materials were sold or deposited, and the date of sale or disposal.

(7) Retain records required by paragraph (f) of this section for at least 2 years.

(g) Submit the following reports to the Administrator:

(1) A report for each analysis of product composite samples performed during the initial 90 days of operation.

(2) A quarterly report, including the following information concerning activities during each consecutive 3-month period:

(i) Results of analyses of monthly product composite samples.

(ii) A description of any deviation from the operating parameters established during performance testing, the duration of the deviation, and steps taken to correct the deviation.

(iii) Disposition of any product produced during a period of deviation, including whether it was recycled, disposed of as asbestos-containing waste material, or stored temporarily on-site until analyzed for asbestos content.

(iv) The information on waste disposal activities as required in §61.154(f).

(h) Nonasbestos (asbestos-free) output material is not subject to any of the provisions of this subpart. Output materials in which asbestos is detected, or output materials produced when the operating parameters deviated from those established during the start-up performance testing, unless shown by TEM analysis to be asbestos-free, shall be considered to be asbestos-containing waste and shall be handled and disposed of according to §§61.150 and 61.154 or reprocessed while all of the established operating parameters are being met.

[55 FR 48431, Nov. 20, 1990]

§ 61.156 Cross-reference to other asbestos regulations.

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In addition to this subpart, the regulations referenced in Table 1 also apply to asbestos and may be applicable to those sources specified in §§61.142 through 61.151, 61.154, and 61.155 of this subpart. These cross-references are presented for the reader's information and to promote compliance with the cited regulations.

Table 1—Cross-Reference to Other Asbestos Regulations

Agency	CFR citation	Comment
EPA	40 CFR part 763, subpart E	Requires schools to inspect for asbestos and implement response actions and submit asbestos management plans to States. Specifies use of accredited inspectors, air sampling methods, and waste disposal procedures.
	40 CFR part 427	Effluent standards for asbestos manufacturing source categories.
	40 CFR part 763, subpart G	Protects public employees performing asbestos abatement work in States not covered by OSHA asbestos standard.
OSHA	29 CFR 1910.1001	Worker protection measures-engineering controls, worker training, labeling, respiratory protection, bagging of waste, permissible exposure level.
	29 CFR 1926.1101	Worker protection measures for all construction work involving asbestos, including demolition and renovation-work practices, worker training, bagging of waste, permissible exposure level.
MSHA	30 CFR part 56, subpart D	Specifies exposure limits, engineering controls, and respiratory protection measures for workers in surface mines.
	30 CFR part 57, subpart D	Specifies exposure limits, engineering controls, and respiratory protection measures for workers in underground mines.
DOT	49 CFR parts 171 and 172	Regulates the transportation of asbestos-containing waste material. Requires waste containment and shipping papers.

[55 FR 48432, Nov. 20, 1990, as amended at 60 FR 31920, June 19, 1995; 68 FR 54793, Sept. 18, 2003; 69 FR 43324, July 20, 2004]

§ 61.157 Delegation of authority.

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(a) In delegating implementation and enforcement authority to a State under section 112(d) of the Act, the authorities contained in paragraph (b) of this section shall be retained by the Administrator and not transferred to a State.

(b) Authorities that will not be delegated to States:

(1) Section 61.149(c)(2)

(2) Section 61.150(a)(4)

(3) Section 61.151(c)

(4) Section 61.152(b)(3)

(5) Section 61.154(d)

(6) Section 61.155(a).

[55 FR 48433, Nov. 20, 1990]

Appendix A to Subpart M of Part 61—Interpretive Rule Governing Roof Removal Operations

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I. Applicability of the Asbestos NESHAP

1.1. Asbestos-containing material (ACM) is material containing more than one percent asbestos as determined using the methods specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy. The NESHAP classifies ACM as either “friable” or “nonfriable”. Friable ACM is ACM that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure. Nonfriable ACM is ACM that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

1.2. Nonfriable ACM is further classified as either Category I ACM or Category II ACM. Category I ACM and Category II ACM are distinguished from each other by their potential to release fibers when damaged. Category I ACM includes asbestos-containing gaskets, packings, resilient floor coverings, resilient floor covering mastic, and asphalt roofing products containing more than one percent asbestos. Asphalt roofing products which may contain asbestos include built-up roofing; asphalt-containing single ply membrane systems; asphalt shingles; asphalt-containing underlayment felts; asphalt-containing roof coatings and mastics; and asphalt-containing base flashings. ACM roofing products that use other bituminous or resinous binders (such as coal tars or pitches) are also considered to be Category I ACM. Category II ACM includes all other nonfriable ACM, for example, asbestos-cement (A/C) shingles, A/C tiles, and transite boards or panels containing more than one percent asbestos. Generally speaking,

Category II ACM is more likely to become friable when damaged than is Category I ACM. The applicability of the NESHAP to Category I and II ACM depends on: (1) the condition of the material at the time of demolition or renovation, (2) the nature of the operation to which the material will be subjected, (3) the amount of ACM involved.

1.3. Asbestos-containing material regulated under the NESHAP is referred to as “regulated asbestos-containing material” (RACM). RACM is defined in §61.141 of the NESHAP and includes: (1) friable asbestos-containing material; (2) Category I nonfriable ACM that has become friable; (3) Category I nonfriable ACM that has been or will be sanded, ground, cut, or abraded; or (4) Category II nonfriable ACM that has already been or is likely to become crumbled, pulverized, or reduced to powder. If the coverage threshold for RACM is met or exceeded in a renovation or demolition operation, then all friable ACM in the operation, and in certain situations, nonfriable ACM in the operation, are subject to the NESHAP.

A. Threshold Amounts of Asbestos-Containing Roofing Material

1.A.1. The NESHAP does not cover roofing projects on single family homes or on residential buildings containing four or fewer dwelling units. 40 CFR 61.141. For other roofing renovation projects, if the total asbestos-containing roof area undergoing renovation is less than 160 ft², the NESHAP does not apply, regardless of the removal method to be used, the type of material (Category I or II), or its condition (friable versus nonfriable). 40 CFR 61.145(a)(4). However, EPA would recommend the use of methods that damage asbestos-containing roofing material as little as possible. EPA has determined that where a rotating blade (RB) roof cutter or equipment that similarly damages the roofing material is used to remove Category I nonfriable asbestos-containing roofing material, the removal of 5580 ft² of that material will create 160 ft² of RACM. For the purposes of this interpretive rule, “RB roof cutter” means an engine-powered roof cutting machine with one or more rotating cutting blades the edges of which are blunt. (Equipment with blades having sharp or tapered edges, and/or which does not use a rotating blade, is used for “slicing” rather than “cutting” the roofing material; such equipment is not included in the term “RB roof cutter”.) Therefore, it is EPA's interpretation that when an RB roof cutter or equipment that similarly damages the roofing material is used to remove Category I nonfriable asbestos-containing roofing material, any project that is 5580 ft² or greater is subject to the NESHAP; conversely, it is EPA's interpretation that when an RB roof cutter or equipment that similarly damages the roofing material is used to remove Category I nonfriable asbestos-containing roofing material in a roof removal project that is less than 5580 ft², the project is not subject to the NESHAP, except that notification is always required for demolitions. EPA further construes the NESHAP to mean that if slicing or other methods that do not sand, grind, cut or abrade will be used on Category I nonfriable ACM, the NESHAP does not apply, regardless of the area of roof to be removed.

1.A.2. For asbestos cement (A/C) shingles (or other Category II roofing material), if the area of the roofing material to be removed is at least 160 ft² and the removal methods will crumble, pulverize, reduce to powder, or contaminate with RACM (from other ACM that

has been crumbled, pulverized or reduced to powder) 160 ft² or more of such roofing material, the removal is subject to the NESHAP. Conversely, if the area of the A/C shingles (or other Category II roofing materials) to be removed is less than 160 ft², the removal is not subject to the NESHAP regardless of the removal method used, except that notification is always required for demolitions. 40 CFR 61.145(a). However, EPA would recommend the use of methods that damage asbestos-containing roofing material as little as possible. If A/C shingles (or other Category II roofing materials) are removed without 160 ft² or more of such roofing material being crumbled, pulverized, reduced to powder, or contaminated with RACM (from other ACM that has been crumbled, pulverized or reduced to powder), the operation is not subject to the NESHAP, even where the total area of the roofing material to be removed exceeds 160 ft²; provided, however, that if the renovation includes other operations involving RACM, the roof removal operation is covered if the total area of RACM from all renovation activities exceeds 160 ft². See the definition of regulated asbestos-containing material (RACM), 40 CFR 61.141.

1.A.3. Only roofing material that meets the definition of ACM can qualify as RACM subject to the NESHAP. Therefore, to determine if a removal operation that meets or exceeds the coverage threshold is subject to the NESHAP, any suspect roofing material (*i.e.* roofing material that may be ACM) should be tested for asbestos. If any such roofing material contains more than one percent asbestos and if the removal operation is covered by the NESHAP, then EPA must be notified and the work practices in §61.145(c) must be followed. In EPA's view, if a removal operation involves at least the threshold level of suspect material, a roofing contractor may choose not to test for asbestos if the contractor follows the notification and work practice requirements of the NESHAP.

B. A/C Shingle Removal (Category II ACM Removal)

1.B.1. A/C shingles, which are Category II nonfriable ACM, become regulated ACM if the material has a high probability of becoming or has become crumbled, pulverized or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations. 40 CFR 61.141. However, merely breaking an A/C shingle (or any other category II ACM) that is not friable may not necessarily cause the material to become RACM. A/C shingles are typically nailed to buildings on which they are attached. EPA believes that the extent of breakage that will normally result from carefully removing A/C shingles and lowering the shingles to the ground will not result in crumbling, pulverizing or reducing the shingles to powder. Conversely, the extent of breakage that will normally occur if the A/C shingles are dropped from a building or scraped off of a building with heavy machinery would cause the shingles to become RACM. EPA therefore construes the NESHAP to mean that the removal of A/C shingles that are not friable, using methods that do not crumble, pulverize, or reduce the A/C shingles to powder (such as pry bars, spud bars and shovels to carefully pry the material), is not subject to the NESHAP provided that the A/C shingles are properly handled during and after removal, as discussed in this paragraph and the asbestos NESHAP. This interpretation also applies to other Category II nonfriable asbestos-containing roofing materials.

C. Cutting vs. Slicing and Manual Methods for Removal of Category I ACM

1.C.1. Because of damage to the roofing material, and the potential for fiber release, roof removal operations using rotating blade (RB) roof cutters or other equipment that sand, grind, cut or abrade the roof material are subject to the NESHAP. As EPA interprets the NESHAP, the use of certain manual methods (using equipment such as axes, hatchets, or knives, spud bars, pry bars, and shovels, but not saws) or methods that slice, shear, or punch (using equipment such as a power slicer or power plow) does not constitute “cutting, sanding, grinding or abrading.” This is because these methods do not destroy the structural matrix or integrity of the material such that the material is crumbled, pulverized or reduced to powder. Hence, it is EPA's interpretation that when such methods are used, assuming the roof material is not friable, the removal operation is not subject to the regulation.

1.C.2. Power removers or power tear-off machines are typically used to pry the roofing material up from the deck after the roof membrane has been cut. It is EPA's interpretation that when these machines are used to pry roofing material up, their use is not regulated by the NESHAP.

1.C.3. As noted previously, the NESHAP only applies to the removal of asbestos-containing roofing materials. Thus, the NESHAP does not apply to the use of RB cutters to remove non-asbestos built up roofing (BUR). On roofs containing some asbestos-containing and some non-asbestos-containing materials, coverage under the NESHAP depends on the methods used to remove each type of material in addition to other coverage thresholds specified above. For example, it is not uncommon for existing roofs to be made of non-asbestos BUR and base flashings that do contain asbestos. In that situation, EPA construes the NESHAP to be inapplicable to the removal of the non-asbestos BUR using an RB cutter so long as the RB cutter is not used to cut 5580 ft² or more of the asbestos-containing base flashing or other asbestos-containing material into sections. In addition, the use of methods that slice, shear, punch or pry could then be used to remove the asbestos flashings and not trigger coverage under the NESHAP.

II. Notification

2.1. Notification for a demolition is always required under the NESHAP. However, EPA believes that few roof removal jobs constitute “demolitions” as defined in the NESHAP (§61.141). In particular, it is EPA's view that the removal of roofing systems (i.e., the roof membrane, insulation, surfacing, coatings, flashings, mastic, shingles, and felt underlayment), when such removal is not a part of a demolition project, constitutes a “renovation” under the NESHAP. If the operation is a renovation, and Category I roofing material is being removed using either manual methods or slicing, notification is not required by the NESHAP. If Category II material is not friable and will be removed without crumbling, pulverizing, or reducing it to powder, no notification is required. Also, if the renovation involves less than the threshold area for applicability as discussed above, then no notification is required. However, if a roof removal meets the applicability and threshold requirements under the NESHAP, then EPA (or the delegated agency) must

be notified in advance of the removal in accordance with the requirements of §61.145(b), as follows:

- Notification must be given in writing at least 10 working days in advance and must include the information in §61.145(b)(4), except for emergency renovations as discussed below.
- The notice must be updated as necessary, including, for example, when the amount of asbestos-containing roofing material reported changes by 20 percent or more.
- EPA must be notified if the start date of the roof removal changes. If the start date of a roof removal project is changed to an earlier date, EPA must be provided with a written notice of the new start date at least 10 working days in advance. If the start date changes to a later date, EPA must be notified by telephone as soon as possible before the original start date and a written notice must be sent as soon as possible.
- For emergency renovations (as defined in §61.141), where work must begin immediately to avoid safety or public health hazards, equipment damage, or unreasonable financial burden, the notification must be postmarked or delivered to EPA as soon as possible, but no later than the following work day.

III. Emission Control Practices

A. Requirements To Adequately Wet and Discharge No Visible Emission

3.A.1. The principal controls contained in the NESHAP for removal operations include requirements that the affected material be adequately wetted, and that asbestos waste be handled, collected, and disposed of properly. The requirements for disposal of waste materials are discussed separately in section IV below. The emission control requirements discussed in this section III apply only to roof removal operations that are covered by the NESHAP as set forth in Section I above.

3.A.2. For any operation subject to the NESHAP, the regulation (§§61.145(c)(2)(i), (3), (6)(i)) requires that RACM be adequately wet (as defined in §61.141) during the operation that damages or disturbs the asbestos material until collected for disposal.

3.A.3. When using an RB roof cutter (or any other method that sands, grinds, cuts or abrades the roofing material) to remove Category I asbestos-containing roofing material, the emission control requirements of §61.145(c) apply as discussed in Section I above. EPA will consider a roof removal project to be in compliance with the “adequately wet” and “discharge no visible emission” requirements of the NESHAP if the RB roof cutter is equipped and operated with the following: (1) a blade guard that completely encloses the blade and extends down close to the roof surface; and (2) a device for spraying a fine mist of water inside the blade guard, and which device is in operation during the cutting of the roof.

B. Exemptions From Wetting Requirements

3.B.1. The NESHAP provides that, in certain instances, wetting may not be required during the cutting of Category I asbestos roofing material with an RB roof cutter. If EPA determines in accordance with §61.145(c)(3)(i), that wetting will unavoidably damage the building, equipment inside the building, or will present a safety hazard while stripping the ACM from a facility component that remains in place, the roof removal operation will be exempted from the requirement to wet during cutting. EPA must have sufficient written information on which to base such a decision. Before proceeding with a dry removal, the contractor must have received EPA's written approval. Such exemptions will be made on a case-by-case basis.

3.B.2. It is EPA's view that, in most instances, exemptions from the wetting requirements are not necessary. Where EPA grants an exemption from wetting because of the potential for damage to the building, damage to equipment within the building or a safety hazard, the NESHAP specifies alternative control methods (§61.145(c)(3)(i)(B)). Alternative control methods include (a) the use of local exhaust ventilation systems that capture the dust, and do not produce visible emissions, or (b) methods that are designed and operated in accordance with the requirements of §61.152, or (c) other methods that have received the written approval of EPA. EPA will consider an alternative emission control method in compliance with the NESHAP if the method has received written approval from EPA and the method is being implemented consistent with the approved procedures (§61.145(c)(3)(ii) or §61.152(b)(3)).

3.B.3. An exemption from wetting is also allowed when the air or roof surface temperature at the point of wetting is below freezing, as specified in §61.145(c)(7). If freezing temperatures are indicated as the reason for not wetting, records must be kept of the temperature at the beginning, middle and end of the day on which wetting is not performed and the records of temperature must be retained for at least 2 years. 42 CFR §61.145(c)(7)(iii). It is EPA's interpretation that in such cases, no written application to, or written approval by the Administrator is needed for using emission control methods listed in §61.145(c)(3)(i)(B), or alternative emission control methods that have been previously approved by the Administrator. However, such written application or approval is required for alternative emission control methods that have not been previously approved. Any dust and debris collected from cutting must still be kept wet and placed in containers. All of the other requirements for notification and waste disposal would continue to apply as described elsewhere in this notice and the Asbestos NESHAP.

C. Waste Collection and Handling

3.C.1. It is EPA's interpretation that waste resulting from slicing and other methods that do not cut, grind, sand or abrade Category I nonfriable asbestos-containing roofing material is not subject to the NESHAP and can be disposed of as nonasbestos waste. EPA further construes the NESHAP to provide that if Category II roofing material (such as A/C shingles) is removed and disposed of without crumbling, pulverizing, or reducing it to powder, the waste from the removal is not subject to the NESHAP waste disposal

requirements. EPA also interprets the NESHAP to be inapplicable to waste resulting from roof removal operations that do not meet or exceed the coverage thresholds described in section I above. Of course, other State, local, or Federal regulations may apply.

3.C.2. It is EPA's interpretation that when an RB roof cutter, or other method that similarly damages the roofing material, is used to cut Category I asbestos containing roofing material, the damaged material from the cut (the sawdust or debris) is considered asbestos containing waste subject to §61.150 of the NESHAP, provided the coverage thresholds discussed above in section 1 are met or exceeded. This sawdust or debris must be disposed of at a disposal site operated in accordance with the NESHAP. It is also EPA's interpretation of the NESHAP that if the remainder of the roof is free of the sawdust and debris generated by the cutting, or if such sawdust or debris is collected as discussed below in paragraphs 3.C.3, 3.C.4, 3.C.5 and 3.C.6, the remainder of the roof can be disposed of as nonasbestos waste because it is considered to be Category I nonfriable material (as long as the remainder of the roof is in fact nonasbestos material or if it is Category I asbestos material and the removal methods do not further sand, grind, cut or abrade the roof material). EPA further believes that if the roof is not cleaned of such sawdust or debris, *i.e.*, it is contaminated, then it must be treated as asbestos-containing waste material and be handled in accordance with §61.150.

3.C.3. In order to be in compliance with the NESHAP while using an RB roof cutter (or device that similarly damages the roofing material) to cut Category I asbestos containing roofing material, the dust and debris resulting from the cutting of the roof should be collected as soon as possible after the cutting operation, and kept wet until collected and placed in leak-tight containers. EPA believes that where the blade guard completely encloses the blade and extends down close to the roof surface and is equipped with a device for spraying a fine mist of water inside the blade guard, and the spraying device is in operation during the cutting, most of the dust and debris from cutting will be confined along the cut. The most efficient methods to collect the dust and debris from cutting are to immediately collect or vacuum up the damaged material where it lies along the cut using a filtered vacuum cleaner or debris collector that meets the requirements of 40 CFR 61.152 to clean up as much of the debris as possible, or to gently sweep up the bulk of the debris, and then use a filtered vacuum cleaner that meets the requirements of 40 CFR 61.152 to clean up as much of the remainder of the debris as possible. On smooth surfaced roofs (nonaggregate roofs), sweeping up the debris and then wet wiping the surface may be done in place of using a filtered vacuum cleaner. It is EPA's view that if these decontamination procedures are followed, the remaining roofing material does not have to be collected and disposed of as asbestos waste. Additionally, it is EPA's view that where such decontamination procedures are followed, if the remaining portions of the roof are non-asbestos or Category I nonfriable asbestos material, and if the remaining portions are removed using removal methods that slice, shear, punch or pry, as discussed in section 1.C above, then the remaining portions do not have to be collected and disposed of as asbestos waste and the NESHAP's no visible emissions and adequately wet requirements are not applicable to the removal of the remaining portions. In EPA's interpretation, the failure of a filtered vacuum cleaner or debris collector to collect larger chunks or pieces of damaged roofing material created by the RB roof cutter does not

require the remaining roofing material to be handled and disposed of as asbestos waste, provided that such visible chunks or pieces of roofing material are collected (e.g. by gentle sweeping) and disposed of as asbestos waste. Other methods of decontamination may not be adequate, and should be approved by the local delegated agency.

3.C.4. In EPA's interpretation, if the debris from the cutting is not collected immediately, it will be necessary to lightly mist the dust or debris, until it is collected, as discussed above, and placed in containers. The dust or debris should be lightly misted frequently enough to prevent the material from drying, and to prevent airborne emissions, prior to collection as described above. It is EPA's interpretation of the NESHAP that if these procedures are followed, the remaining roofing material does not have to be collected and disposed of as asbestos waste, as long as the remaining roof material is in fact nonasbestos material or if it is Category I asbestos material and the removal methods do not further sand, grind, cut or abrade the roof material.

3.C.5. It is EPA's interpretation that, provided the roofing material is not friable prior to the cutting operation, and provided the roofing material has not been made friable by the cutting operation, the appearance of rough, jagged or damaged edges on the remaining roofing material, due to the use of an RB roof cutter, does not require that such remaining roofing material be handled and disposed of as asbestos waste. In addition, it is also EPA's interpretation that if the sawdust or debris generated by the use of an RB roof cutter has been collected as discussed in paragraphs 3.C.3, 3.C.4 and 3.C.6, the presence of dust along the edge of the remaining roof material does not render such material "friable" for purposes of this interpretive rule or the NESHAP, provided the roofing material is not friable prior to the cutting operation, and provided that the remaining roofing material near the cutline has not been made friable by the cutting operation. Where roofing material near the cutline has been made friable by the use of the RB cutter (*i.e.* where such remaining roofing material near the cutline can be crumbled, pulverized or reduced to powder using hand pressure), it is EPA's interpretation that the use of an encapsulant will ensure that such friable material need not be treated or disposed of as asbestos containing waste material. The encapsulant may be applied to the friable material after the roofing material has been collected into stacks for subsequent disposal as nonasbestos waste. It is EPA's view that if the encapsulation procedure set forth in this paragraph is followed in operations where roofing material near the cutline has been rendered friable by the use of an RB roof cutter, and if the decontamination procedures set forth in paragraph 3.C.3 have been followed, the NESHAP's no visible emissions and adequately wet requirements would be met for the removal, handling and disposal of the remaining roofing material.

3.C.6. As one way to comply with the NESHAP, the dust and debris from cutting can be placed in leak-tight containers, such as plastic bags, and the containers labeled using warning labels required by OSHA (29 CFR 1926.58). In addition, the containers must have labels that identify the waste generator (such as the name of the roofing contractor, abatement contractor, and/or building owner or operator) and the location of the site at which the waste was generated.

IV. Waste Disposal

A. Disposal Requirements

4.A.1. Section 61.150(b) requires that, as soon as is practical, all collected dust and debris from cutting as well as any contaminated roofing squares, must be taken to a landfill that is operated in accordance with §61.154 or to an EPA-approved site that converts asbestos waste to nonasbestos material in accordance with §61.155. During the loading and unloading of affected waste, asbestos warning signs must be affixed to the vehicles.

B. Waste Shipment Record

4.B.1. For each load of asbestos waste that is regulated under the NESHAP, a waste shipment record (WSR) must be maintained in accordance with §61.150(d). Information that must be maintained for each waste load includes the following:

- Name, address, and telephone number of the waste generator
- Name and address of the local, State, or EPA regional office responsible for administering the asbestos NESHAP program
- Quantity of waste in cubic meters (or cubic yards)
- Name and telephone number of the disposal site operator
- Name and physical site location of the disposal site
- Date transported
- Name, address, and telephone number of the transporter(s)
- Certification that the contents meet all government regulations for transport by highways.

4.B.2. The waste generator is responsible for ensuring that a copy of the WSR is delivered to the disposal site along with the waste shipment. If a copy of the WSR signed by the disposal site operator is not returned to the waste generator within 35 days, the waste generator must contact the transporter and/or the disposal site to determine the status of the waste shipment. 40 CFR 61.150(d)(3). If the signed WSR is not received within 45 days, the waste generator must report, in writing, to the responsible NESHAP program agency and send along a copy of the WSR. 40 CFR 61.150(d)(4). Copies of WSRs, including those signed by the disposal site operator, must be retained for at least 2 years. 40 CFR 61.150(d)(5).

V. Training

5.1. For those roof removals that are subject to the NESHAP, at least one on-site supervisor trained in the provisions of the NESHAP must be present during the removal of the asbestos roofing material. 40 CFR 61.145(c)(8). In EPA's view, this person can be a job foreman, a hired consultant, or someone who can represent the building owner or contractor responsible for the removal. In addition to the initial training requirement, a refresher training course is required every 2 years. The NESHAP training requirements became effective on November 20, 1991.

5.2. Asbestos training courses developed specifically to address compliance with the NESHAP in roofing work, as well as courses developed for other purposes can satisfy this requirement of the NESHAP, as long as the course covers the areas specified in the regulation. EPA believes that Asbestos Hazard Emergency Response Act (AHERA) training courses will, for example, satisfy the NESHAP training requirements. However, nothing in this interpretive rule or in the NESHAP shall be deemed to require that roofing contractors or roofing workers performing operations covered by the NESHAP must be trained or accredited under AHERA, as amended by the Asbestos School Hazard Abatement Reauthorization Act (ASHARA). Likewise, state or local authorities may independently impose additional training, licensing, or accreditation requirements on roofing contractors performing operations covered by the NESHAP, but such additional training, licensing or accreditation is not called for by this interpretive rule or the federal NESHAP.

5.3. For removal of Category I asbestos containing roofing material where RB roof cutters or equipment that similarly damages the asbestos-containing roofing material are used, the NESHAP training requirements (§61.145(c)(8)) apply as discussed in Section I above. It is EPA's intention that removal of Category I asbestos-containing roofing material using hatchets, axes, knives, and/or the use of spud bars, pry bars and shovels to lift the roofing material, or similar removal methods that slice, punch, or shear the roof membrane are not subject to the training requirements, since these methods do not cause the roof removal to be subject to the NESHAP. Likewise, it is EPA's intention that roof removal operations involving Category II nonfriable ACM are not subject to the training requirements where such operations are not subject to the NESHAP as discussed in section I above.

[59 FR 31158, June 17, 1994, as amended at 60 FR 31920, June 19, 1995]



Department of Energy
Environmental Protection Agency
Washington, D.C.
[Signed September 25, 2002]



MEMORANDUM

SUBJECT: Clarification to 1998 Agreement Regarding the National Remedy Review Board Review Criteria for Department of Energy Non-Time Critical Removal Actions

FROM: Patrice M. Bubar, Associate Deputy Assistant Secretary /s/ **Patrice M. Bubar**
Office of Integration and Disposition
United States Department of Energy

James E. Woolford, Director /s/ **for Renee P. Wynn**
Federal Facilities Restoration and Reuse Office
United States Environmental Protection Agency

Michael B. Cook, Director /s/ **Michael B. Cook**
Office of Emergency and Remedial Response
United States Environmental Protection Agency

TO: Distribution

Purpose

The purpose of this memorandum is to provide additional clarification on the applicability of the October 5, 1998, joint Environmental Protection Agency (EPA) and the Department of Energy (DOE) agreement on DOE decommissioning projects titled *Review of Department of Energy Non-Time Critical Removal Actions by the National Remedy Review Board*.

In summary, response actions conducted as non-time critical removal actions (NTCRA) that involve the decommissioning of facilities do not require National Remedy Review Board (NRRB) review unless the estimated costs of the *non*-decommissioning activities are estimated to exceed \$30 million.

Background

On October 5, 1998, the DOE and the EPA issued the above joint agreement announcing that DOE NTCRAs are subject to NRRB review whenever the action is estimated to cost more than \$30 million.

The DOE and EPA had previously issued a joint policy on May 22, 1995, titled *Policy on Decommissioning of DOE Facilities Under Comprehensive Environmental Response Compensation and Liability Act (CERCLA)* which states that generally, DOE decommissioning

should be done as NTCRAs.¹ A key reason for promoting the use of NTCRAs for decommissioning activity is that available cleanup alternatives are typically clear and very limited. Thus, the agencies have concluded there would be little benefit in having the NRRB review such decommissioning actions. It was not the intent of DOE and EPA to have the October 5, 1998, agreement apply to the decommissioning of facilities, but rather to apply to actions addressing contaminants in environmental media (e.g., air, soils, surface water, and ground water).

Implementation

The DOE field and EPA regional personnel should continue to submit the DOE NTCRAs, which do not address decommissioning of facilities, for NRRB review whenever the NRRB threshold criterion of \$30 million is met. The NTCRAs involving the decommissioning of facilities should not be submitted for the NRRB review unless the estimated cost of the *non*-decommissioning portion of the action exceeds the NRRB review criteria.

The DOE field and EPA regional personnel are reminded that the NRRB review criteria for DOE **remedial** actions remain at: 1) \$75 million estimated cost regardless of whether the action includes decommissioning activity; or 2) the action is estimated to cost more than \$25 million and is 50 percent greater in cost than the least costly, protective, cleanup alternative that complies with other laws or regulations applicable or relevant and appropriate to the response regardless of whether the action includes decommissioning activity.

Contacts

Any questions or comments may be directed to Mr. Bruce Means, Office of Emergency and Remedial Response, EPA, at (703) 603-8815; Mr. Tim Mott, Federal Facilities Restoration and Reuse Office, EPA, at (703) 603 8807; or Mr. Steve Golian, Office of Technical Program Integration, DOE, at (301) 903-7791.

cc:

J. Roberson, DOE

B. Cook, DOE

M. Horinko, EPA

J. P. Suarez, EPA

¹Decommissioning includes those activities that take place after a facility has been deactivated and placed in an ongoing surveillance and maintenance program. Decommissioning can include decontamination, dismantlement, or entombment. For the purpose of this policy statement, decontamination encompasses the removal or reduction of radioactive or hazardous contamination from buildings and structures *but not from environmental media such as air, soils, surface water, and/or ground water*. Dismantlement involves the disassembly or demolition, and removal, of any structure, system, or component and the interim or long-term disposal of waste materials in compliance with applicable requirements.

Deactivation is the process of placing a facility in a safe and stable condition that is protective of workers, the public, and the environment until decommissioning is initiated. As the bridge between operation and decommissioning, deactivation can accomplish operations-like activities such as final process runs, and also decontamination activities aimed at placing the facility in a safe and stable condition.

Distribution:

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Marvin E. Gunn, Jr., Manager, Chicago Operations Office (CH)
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Keith Takata, EPA Region 9
Nancy Lindsay, EPA Region 9
Mike Gearheard, EPA Region 10
National Remedy Review Board, EPA
Federal Facilities Leadership Council, EPA

Removal Action Work Plan for Central Plateau General Decommissioning Activities

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management



U.S. DEPARTMENT OF
ENERGY

Richland Operations
Office

P.O. Box 550
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

Removal Action Work Plan for Central Plateau General Decommissioning Activities

Date Published
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Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management



U.S. DEPARTMENT OF
ENERGY

Richland Operations
Office

P.O. Box 550
Richland, Washington 99352

J. D. Caswell
Release Approval 24/09/2010
Date

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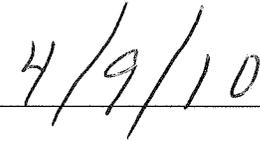
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Signature Sheet

Signature sheet for the Removal Action Work Plan covering general decommissioning activities at the U.S. Department of Energy's Hanford Site.

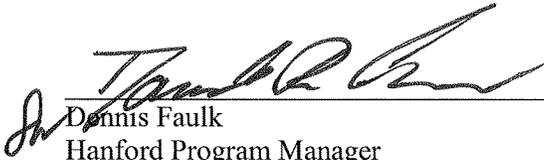
Handwritten signature: J. Arabes for M.S. McCormick

Matthew S. McCormick
Assistant Manager for Central Plateau
U.S. Department of Energy Richland Operations Office

Handwritten date: 4/9/10
Date

Signature Sheet

Having considered the extent to which the Removal Action Work Plan, DOE/RL-2010-33, *Removal Action Work Plan for Central Plateau General Decommissioning Activities*, could be inconsistent with *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* processes or could alter schedules set forth in Appendix D of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement), the U.S. Environmental Protection Agency approves pursuant to Section 7.2.4 of the Tri-Party Agreement Action Plan.



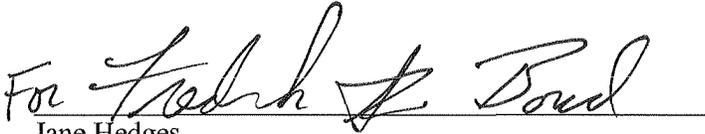
Dennis Faulk
Hanford Program Manager
Region 10
U.S. Environmental Protection Agency



Date

Signature Sheet

Having considered the extent to which the Removal Action Work Plan, DOE/RL-2010-33, *Removal Action Work Plan for Central Plateau General Decommissioning Activities*, could be inconsistent with *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* processes or could alter schedules set forth in Appendix D of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement), the State of Washington, Department of Ecology approves pursuant to Section 7.2.4 of the Tri-Party Agreement Action Plan.



Jane Hedges
Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology


Date

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Terms

ACM	asbestos-containing material
Action Memorandum	DOE/RL-2010-22, <i>Action Memorandum for General Hanford Site Decommissioning Activities</i>
ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
BFA	building footprint area
CAA	<i>Clean Air Act of 1990</i>
CCRC	Centralized Consolidated Recycling Center
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CFR	<i>Code of Federal Regulations</i>
CRR	cultural resource review
D4	decontamination, deactivation, decommissioning, and demolition
dpm	disintegrations per minute
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ETF	200 Area Effluent Treatment Facility
HASP	health and safety plan
HEPA	high-efficiency particulate air (filter)
LDR	land disposal restriction
LLW	low-level waste
MEI	maximally exposed individual
ML	large PCB mark
NRC	National Response Center
NESHAP	“National Emission Standards for Hazardous Air Pollutants”
NTCRA	non-time-critical removal action

OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PPE	personal protection equipment
PTE	potential-to-emit
RACM	regulated asbestos-containing material
RAWP	removal action work plan
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RWP	radiological work permit
SPOC	single point of contact
TEDE	total effective dose equivalent
Treatment Plan	<i>DOE/RL-97-56, Manhattan Project and Cold War Era Historic District Treatment Plan</i>
Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
TSCA	<i>Toxic Substances Control Act of 1976</i>
UIC	underground injection control (well)
WAC	<i>Washington Administrative Code</i>
WIDS	waste information data system (site)

1 Introduction

This removal action work plan (RAWP) implements the Central Plateau-related workscope of the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Action Memorandum for General Hanford Site Decommissioning Activities*, DOE/RL-2010-22 (Action Memorandum) which implements the selected alternative from DOE/RL-2010-14, *Engineering Evaluation/Cost Analysis for General Hanford Site Decommissioning Activities*. Specifically, this RAWP will be used for the decommissioning of Hanford excess industrial buildings and structures and cleanup of miscellaneous debris that are located within the Hanford Central Plateau. This RAWP is one of several RAWPs being developed to implement the activities covered in the Action Memo. The rationale for multiple RAWPs is to facilitate implementation of the workscope by U.S. Department of Energy (DOE) contractors in accordance with their separate contracts, procedures, and processes.

This document provides details necessary for implementation of Alternative 3: Decontamination, Deactivation, Decommissioning, and Demolition (D4) of Buildings/Structures and Cleanup of Debris, which was identified in the Action Memorandum¹ as the selected alternative. The RAWP identifies technical requirements of the removal action and details the work elements, performance measurements, project management and oversight, and schedules for implementation of the removal action.

This RAWP will implement the non-time-critical removal action (NTCRA), which will minimize the release or threat of release of hazardous substances from the Hanford excess industrial buildings/structures and miscellaneous debris that pose a risk to human health and the environment.

1.1 Purpose

This RAWP establishes the methods and activities to support the removal action, i.e., decommissioning of Hanford excess industrial buildings and structures and cleanup of miscellaneous debris. This RAWP describes:

1. The removal action elements and how they will be implemented, as well as the safety and health management and controls
2. Environmental management and controls, including applicable or relevant and appropriate requirements (ARARs), waste management, airborne emissions, reporting for non-routine releases, cultural/ecological resources
3. Project administration for the removal action.

The intent of this RAWP is to identify the basis and to provide criteria for the preparation of work packages and subcontract task orders for the project tasks. Using the most recent information concerning the conditions for each building or structure or debris, field-level work packages will be developed to direct work activities and instruct workers in the applicable work methods.

The removal action is consistent with the overall Hanford cleanup initiative and will, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action, as required by 40 *Code of Federal Regulations* (CFR) 300.415(d). To accomplish this, the following removal action objectives were identified.

¹ All descriptions and discussion pertaining to implementation of the removal action (i.e., DOE/RL-2010-22) apply only to work performed within the scope of this RAWP. Information regarding implementation of any other work is or will be addressed, as appropriate, in other documentation.

1. Protect human and ecological receptors from exposure to contaminants above acceptable exposure levels in buildings/structures.
2. Control the migration of contaminants from the buildings/structures and debris into the environment.
3. Facilitate and, to the extent practicable, be consistent with anticipated remedial actions at Hanford.
4. Achieve ARARs to the extent practicable.
5. Safely treat, as appropriate, and dispose of waste streams generated by the removal action.
6. Prevent adverse impacts to cultural and natural resources.
7. Reduce or eliminate the need for future surveillance, maintenance, or periodic inspection activities.

The DOE, as the lead agency for this removal action, will assign an on-scene coordinator that will oversee the response activities.

1.2 Scope

The scope encompasses excess industrial buildings and structures that were never used for radiological or chemical processing and cleanup of miscellaneous debris. However, these buildings, structures, and debris may be potentially contaminated with hazardous substances as a result of their proximity to Hanford Site contamination and based on the building/structures and debris components and contents (e.g., asbestos, paints, coatings, etc.). A listing of buildings/structures planned for decommissioning by DOE and subject to the scope of this RAWP is provided in Section 1.3.

Some buildings/structures slated for decommissioning may be found to be unsuitable for inclusion within the NTCRA, or DOE may find unforeseen future uses prior to performing the decommissioning. If this occurs and eliminating the buildings/structures from the list identified in Section 1.3 is appropriate, DOE will place documentation in the Administrative Record for this NTCRA identifying the building or structure and explaining why it is no longer appropriate for inclusion under the scope of the NTCRA. Furthermore, DOE may need to decommission other Hanford buildings and structures with similar characteristics, contaminants, and complexity to those specifically identified in Section 1.3. The Action Memorandum (DOE/RL-2010-22) allows for the potential future inclusion of such buildings and structures under the scope of this NTCRA. If additional buildings and structures are added to the list in Section 1.3, concurrence from Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) will first be obtained, and DOE will place a letter in the Administrative Record for this NTCRA, identifying the building or structure to be added and explaining why it is sufficiently similar to the facilities specifically identified in the Action Memorandum (DOE/RL-2010-22) and this RAWP.

1.3 Site Conditions and Background

This section provides an overview of the site conditions and background information for Hanford and the buildings and sites subject to this removal action.

1.3.1 Physical Location

The Hanford Site lies within the semi-arid Pasco Basin of the Columbia Plateau in southeast Washington State. The site, a relatively undeveloped area of shrub-steppe habitat (a drought-resistant, shrub and grassland ecosystem) containing a rich diversity of plant and animal species, occupies an area of approximately 1,517 km² (586 mi²) located north of the city of Richland. This area has restricted public access and provides a buffer for areas on the site that were used for nuclear materials production, waste

storage, and waste disposal. The Columbia River flows eastward through the northern part of the site and then turns south, forming part of the eastern site boundary. Elevations across the central portion of the basin and the Hanford Site range from about 119 m (390 ft) above mean sea level at the Columbia River to 1,060 m (3,480 ft) above mean sea level at Rattlesnake Mountain, which forms the southwestern boundary of the site. Public access to the Hanford Site currently is restricted and controlled at the Wye Barricade on Route 4 and the Yakima and Rattlesnake Barricades on State Highway 240 (Figure 1-1).

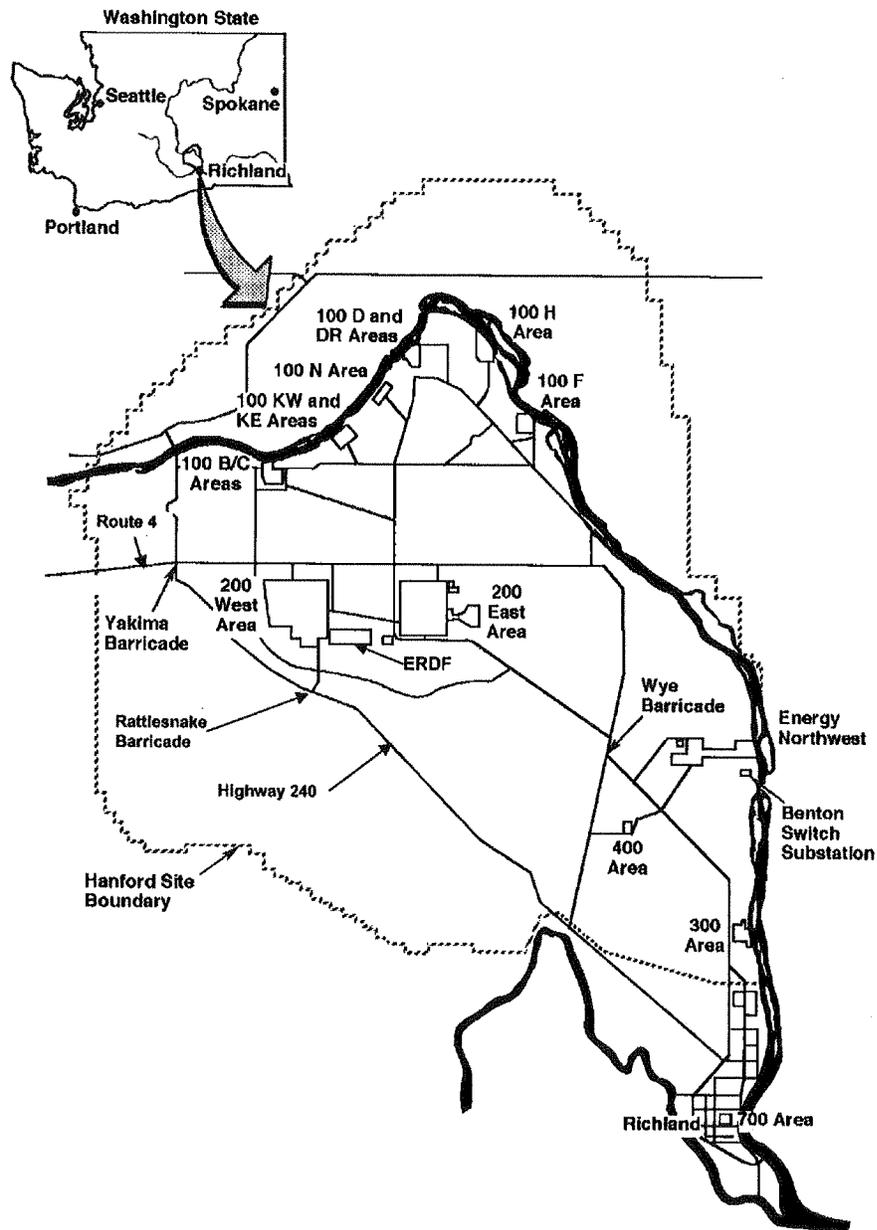


Figure 1-1. Hanford Site.

The Hanford Site includes nearly 1,000 buildings/structures that are or have been used to support site activities. Many of these buildings/structures were not used for radiological or chemical processing, but may have some incidental contamination from proximity to other buildings/structures. Hanford excess industrial buildings/structures are potentially contaminated with radioactive and chemical hazardous substances and are generally small, wood-framed, metal, cinder block, or concrete structures used for offices, change rooms, material storage buildings, or effluent monitoring buildings. To qualify under this NTCRA, the buildings/structures must meet the following criteria:

- The buildings/structures are suitable for routine decommissioning and/or demolition methods.
- The buildings/structures have not been addressed by another approved CERCLA decision document or *Resource Conservation and Recovery Act of 1976 (RCRA)* closure plan for which the implementation would eliminate the release or threat of release of hazardous substances to the environment.

The debris is located throughout the Hanford Site and includes miscellaneous aboveground utility structures and components that are no longer in use, abandoned fencing, concrete and rubble, scrap metal, and general solid wastes that may include some radiological or chemical components.

Table 1-1 provides a list of the building/structures that have been identified to undergo D4 through implementation of this RAWP. As identified in the Action Memorandum, additional buildings will be identified, subject to review and approval by EPA and Ecology.

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
613	600	70
614	600	10
616	600	1,240
620	600	10
622	600	10
626	600	10
6265	600	290
6267	600	140
6268	600	210
6270	600	380
6290	600	700
6291	600	20
6292	600	30
6293	600	150
6653	600	20
251W	600	980
2901W	600	10

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
506B	600	140
506BA	600	380
609A	600	3,240
609D	600	250
609G	600	240
609H	600	310
622A	600	30
622B	600	20
622C	600	90
622F	600	260
622R	600	1,480
6265A	600	60
6266A	600	60
6266B	600	20
6653A	600	10
MO280	600	740
MO292	600	740

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO315	600	50
MO667	600	20
2025EC71	200E	10
207BA	200E	10
209EA	200E	410
2101HV	200E	1,200
2101M	200E	12,900
2103HV	200E	30
2105HV	200E	200
210A	200E	70
210E	200E	10
211A	200E	940
211B	200E	380
211BA	200E	80
211BA151	200E	10
211BB	200E	10
2125E	200E	100
214A	200E	80
217B	200E	40
218B	200E	10
219B	200E	10
221A	200E	70
221BA	200E	10
221BG	200E	10
2220E	200E	170
2230E	200E	120
2237E	200E	60
2258E	200E	10
225B-BA	200E	50
225BC	200E	80
225BD	200E	20
225BE	200E	260
225BG	200E	120
225EC	200E	10
2400E	200E	60
2402EC	200E	10
2402EG	200E	40

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
2403E	200E	90
2403EA	200E	20
2404E	200E	20
241A201	200E	230
241AN273	200E	20
241AN274	200E	10
241AN801	200E	10
241AP273	200E	20
241AP801	200E	10
241AW273	200E	20
241AW801	200E	10
241AZ156	200E	80
241AZ271	200E	90
241B701	200E	10
241C73	200E	10
241C90	200E	20
242A81	200E	50
242A-BA	200E	190
242AC	200E	60
242AL11	200E	100
242AL71	200E	10
243G1	200E	100
243G1A	200E	30
243G2	200E	90
243G3	200E	40
243G4	200E	50
243G6	200E	30
243G81	200E	10
243G82	200E	10
243G9	200E	20
244AR701	200E	20
244AR715	200E	40
2451E	200E	10
246S	200E	100
2506E1	200E	40
2506E2	200E	40
252E	200E	70

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
2701AB	200E	220
2701EC	200E	30
2701HV	200E	170
2701M	200E	20
2703E	200E	310
2704HV	200E	20,270
2711B	200E	20
2711E	200E	570
2711E66	200E	100
2711E66A	200E	10
2711EA	200E	360
2711EB	200E	360
2711EC	200E	10
2712A	200E	30
2712B	200E	10
2714A	200E	170
2715B	200E	40
2715EC	200E	80
2715ED	200E	60
2716E	200E	60
2718E	200E	140
2719EA	200E	150
271AB	200E	660
271BA	200E	30
2721E	200E	1,320
2721EA	200E	600
2727E	200E	790
272AW	200E	2,020
272B	200E	140
272BA	200E	80
272BB	200E	70
272E	200E	1,500
272HV	200E	290
2734EA	200E	30
273E	200E	480
274AW	200E	740
274E	200E	310

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
2750E	200E	8,030
2751E	200E	1,200
2752E	200E	1,200
2753E	200E	1,200
275E	200E	470
275EA	200E	3,280
275E-BA	200E	40
276B	200E	110
277A	200E	260
278AW	200E	150
281A	200E	10
282B	200E	20
282BA	200E	20
282E	200E	110
282EA	200E	30
282EB	200E	50
282EC	200E	220
282ED	200E	30
283E	200E	3,070
283EA	200E	230
283E-BA	200E	50
284E	200E	4,810
284EB	200E	1,270
2901A	200E	130
2902B	200E	210
2902E	200E	70
2902HV80	200E	160
2902HV82	200E	140
2902HV83	200E	40
291AG	200E	10
291AJ	200E	10
292B	200E	50
294B	200E	30
295AE	200E	30
C8S49	200E	20
C8S77	200E	10
MO029	200E	220

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO041	200E	150
MO104	200E	110
MO110	200E	10
MO112	200E	80
MO211	200E	50
MO232	200E	150
MO234	200E	740
MO247	200E	150
MO248	200E	150
MO251	200E	150
MO252	200E	150
MO253	200E	150
MO254	200E	150
MO256	200E	150
MO257	200E	150
MO266	200E	150
MO267	200E	150
MO268	200E	150
MO269	200E	150
MO272	200E	130
MO276	200E	1,180
MO277	200E	1,180
MO282	200E	150
MO283	200E	150
MO284	200E	150
MO285	200E	890
MO286	200E	890
MO294	200E	1,180
MO312	200E	20
MO354	200E	100
MO370	200E	10
MO377	200E	40
MO386	200E	148
MO388	200E	150
MO398	200E	20
MO399	200E	30
MO400	200E	370

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO405	200E	1,110
MO407	200E	370
MO408	200E	220
MO410	200E	220
MO413	200E	590
MO414	200E	890
MO421	200E	20
MO434	200E	150
MO439	200E	60
MO493	200E	230
MO497	200E	60
MO501	200E	20
MO503	200E	10
MO511	200E	140
MO546	200E	20
MO571	200E	60
MO722	200E	150
MO723	200E	150
MO724	200E	150
MO725	200E	150
MO727	200E	30
MO730	200E	50
MO732	200E	150
MO733	200E	120
MO734	200E	150
MO742	200E	20
MO816	200E	30
MO840	200E	60
MO844	200E	60
MO850	200E	230
MO890	200E	10
MO919	200E	110
MO974	200E	40
MO979	200E	150
MO996	200E	110
MO997	200E	110
MO998	200E	20

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
TC272HV	200E	70
200CC-BA	200W	40
201W	200W	30
211T	200W	200
211T52	200W	10
212S	200W	70
216ZP1A	200W	30
218W5-252	200W	10
218W5-252A	200W	10
2220W	200W	170
222SA	200W	380
222S-BA	200W	70
222SD	200W	90
222SF	200W	60
222SH	200W	60
222T	200W	1,200
2259W	200W	30
225WA	200W	20
225WB	200W	10
2262W	200W	50
2263W	200W	40
2265W	200W	30
2300W	200W	110
2304W	200W	60
2306W	200W	70
2307W	200W	70
2308W	200W	70
2309W	200W	290
2310W	200W	120
2314W	200W	40
2315W	200W	20
2318W	200W	80
234-5Z-BA	200W	150
2402W	200W	10
2402WB	200W	320
2402WC	200W	320
2402WD	200W	320

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
2402WE	200W	320
2402WF	200W	320
2402WG	200W	320
2402WH	200W	320
2402WI	200W	320
2402WJ	200W	320
2402WK	200W	320
2402WL	200W	320
241SX281	200W	30
241SX701	200W	40
241SY272	200W	20
241SY276	200W	10
241T701	200W	10
241TX701	200W	10
242T271	200W	10
242T601	200W	80
242TC	200W	10
2506W1	200W	40
252S	200W	60
2620W	200W	330
267Z	200W	10
2704S	200W	650
2707SX	200W	110
2708S	200W	10
2710S	200W	30
2710W	200W	10
2711S	200W	10
2712T	200W	10
2713WC	200W	140
2715S	200W	20
2715T	200W	50
2715WA	200W	190
2716S	200W	140
2719WB	200W	370
2722W	200W	110
2727W	200W	190
2727WA	200W	190

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
272S	200W	690
272WA	200W	1,240
272W-BA	200W	50
2734S	200W	40
273W	200W	480
2740W	200W	890
2754W	200W	370
275W	200W	320
277T	200W	100
278WA	200W	150
282W	200W	110
282WA	200W	30
282WB	200W	10
282WC	200W	220
282WD	200W	30
283W	200W	3,370
283WA	200W	230
283WB	200W	20
283W-BA	200W	50
283WC	200W	60
283WD	200W	30
283WE	200W	80
283WF	200W	30
284W	200W	4,110
284WB	200W	140
285W	200W	10
286W	200W	10
2901S	200W	210
2902W	200W	70
2904SA	200W	10
HS0001	200W	20
HS0002	200W	20
MO011	200W	130
MO014	200W	70
MO015	200W	50
MO016	200W	50
MO017	200W	50

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO027	200W	150
MO028	200W	220
MO031	200W	220
MO032	200W	220
MO037	200W	440
MO039	200W	220
MO107	200W	130
MO223	200W	50
MO235	200W	150
MO240	200W	150
MO244	200W	220
MO249	200W	150
MO250	200W	150
MO264	200W	150
MO273	200W	740
MO278	200W	740
MO279	200W	740
MO281	200W	1,180
MO287	200W	890
MO288	200W	30
MO289	200W	30
MO290	200W	150
MO291	200W	740
MO295	200W	20
MO406	200W	220
MO409	200W	300
MO412	200W	440
MO428	200W	150
MO429	200W	150
MO432	200W	150
MO433	200W	150
MO437	200W	150
MO438	200W	150
MO444	200W	50
MO446	200W	50
MO450	200W	10
MO459	200W	70

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO556	200W	100
MO563	200W	50
MO573	200W	20
MO710	200W	10
MO720	200W	1,180
MO721	200W	300
MO739	200W	40
MO743	200W	440
MO760	200W	120
MO837	200W	50
MO841	200W	100

Table 1-1. Building / Structure List and Locations

Building/Structure Designation	Area	ERDF Approximate Waste Quantity (ton)
MO847	200W	20
MO892	200W	110
MO906	200W	110
MO939	200W	50
MO956	200W	120
MO970	200W	270
MO971	200W	270
X8	200W	10

1.3.2 Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

Contaminant sources addressed by this RAWP include both radioactive and chemical hazardous substances.

The primary sources of hazardous substances potentially include, but are not limited to the following:

- Americium-241
- Cesium isotopes
- Cobalt-60
- Europium isotopes
- Strontium-90
- Plutonium isotopes
- Uranium isotopes
- Tritium (in exit signs)
- Asbestos-containing material (ACM)
- Cadmium
- Beryllium
- Lead paint and shielding
- Polychlorinated biphenyls (PCBs) (e.g., light ballasts and surface coatings)
- Mercury (typically found in electrical switches, gauges, thermometers and lighting)
- Refrigerants (e.g., Freon)
- Lubricants
- Corrosives
- Creosote

- Arsenic
- Biological hazards from animal intrusion in facilities
- Chemicals (old containers of residual chemical constituents).

The removal activities will be performed in accordance with contractor procedures that ensure control over hazardous substances. The contractor's standards and procedures for management of hazardous substances ensure that personnel removing, handling, and disposing of waste perform work in a manner that achieves the following objectives:

- Protects the safety of employees and the general public
- Minimizes spills and releases to the environment
- Meets applicable DOE, federal, state, and local regulatory requirements.

1.3.2.1 Asbestos

ACM could be found in and around buildings/structures and within miscellaneous debris. Unnecessary disturbance of vessel or piping insulation, loose floor tiles, transite wall coverings or panels, sheetrock, electrical wire insulation, ducting, or other suspect ACM will be avoided.

1.3.2.2 Cadmium

Cadmium is a byproduct of the metal-finishing process and could also be present in electrical equipment. At certain levels, cadmium is regulated as a hazardous waste. If waste containing cadmium above regulatory limits is generated, it will be treated, as appropriate, prior to disposal.

1.3.2.3 Beryllium

Beryllium contamination could be present in buildings/structures and debris addressed under this removal action. Although beryllium is not regulated as a hazardous waste, there are health and safety requirements that must be addressed when working with beryllium-contaminated structures.

1.3.2.4 Lead

Lead may exist in surface coatings (e.g., lead-based paint, lead-shielded cables), plumbing, and in other forms (e.g., lead shot, brick, sheet, and cast-lead forms). Personnel must exercise caution to avoid disturbing or contacting lead or suspect lead material.

1.3.2.5 PCBs

PCBs may be found in facilities/structures and debris (e.g., painted surfaces and waste oils). Materials removed or demolished that contain or may contain PCBs will be removed for disposal consistent with substantive standards of *Toxic Substances Control Act of 1976 (TSCA)*

1.3.2.6 Mercury

Mercury could be present in electrical equipment. At certain levels, mercury is regulated as a dangerous waste. Waste containing mercury above regulatory limits will require treatment prior to disposal.

1.3.2.7 Refrigerants

Refrigerants are regulated due to their effect on the ozone layer of the atmosphere. Refrigerants will be "recovered" to the extent practicable prior to disposal of the equipment.

1.3.2.8 Lubricants

Lubricants may contain hazardous substances. Equipment will be drained of lubricants to the extent practicable prior to disposal.

1.3.2.9 Commercial Solvents

Commercial solvents may be categorized as a dangerous waste. Equipment will be drained of commercial solvents that may require treatment prior to disposal.

1.3.2.10 Corrosives

Corrosives may be encountered. In the State of Washington, corrosive solids and liquid waste above the regulatory limits must be treated, as appropriate, prior to disposal.

1.3.2.11 Sodium Vapor and Mercury Vapor Lighting

Sodium vapor and mercury vapor lighting may be dispositioned through the Hanford Site Centralized Consolidated Recycling Center (CCRC) in lieu of disposal. Sodium and mercury above certain concentrations are regulated as dangerous waste. Regulated materials destined for disposal will be treated, as appropriate.

1.3.2.12 Biological Hazards

Biological hazards such as bird and rodent carcasses and feces could be encountered. Such materials, if contaminated with hazardous substances, will be treated and disposed as appropriate.

1.3.2.13 Chemicals

The potential exists for the discovery of residual chemicals (e.g., solvents, greases, hydraulic and fuel oils, and aerosols). These materials will be recycled or disposed in accordance with requirements of the receiving facility.

2 Removal Action Elements

The following subsections provide a general description of the work activities that will be performed as part of the D4 and debris cleanup activities.

2.1 Removal Action Work Activities

Implementation of this removal action may include the following activities:

- Remove the nonradiological and radiological hazardous substances from within and around the buildings/structures, as appropriate
- Decontaminate, fix contamination, and isolate systems, as needed
- Demolish each building/structure to grade or below, as appropriate
- Deactivate remaining below-grade structures (e.g., basements, utilities) and fill void spaces
- Clean up miscellaneous debris
- Dispose of wastes generated during D4 or debris cleanup activities
- Stabilize the area, as needed.

Using the most recent information concerning field conditions, work packages will be developed to direct work activities and instruct workers in the most appropriate work methods. Work packages will be written in accordance with this RAWP. Existing contractor procedures and specifically developed instructions will be used to perform and control the removal and disposal activities. Field activities are described in more detail in Section 2.2.

2.2 Field Activities

The following subsections describe the field activities that may be associated with this removal action.

2.2.1 Mobilization and Site Preparation

Mobilization and site preparation may include the following:

- Establishing site utility services (e.g., temporary power, lighting, and water)
- Constructing roads, field support facilities, waste container survey and storage areas, and decontamination stations. Hanford Site roadways will be constructed of existing site materials, except the surface course, which may be imported
- Isolating and/or verifying isolation of utilities and systems
- Identification of underground injection control (UIC) wells in the proximity of the work area and notifying the company single point of contact (SPOC).

2.2.2 Removal Activities

The following subsections describe removal activities.

2.2.2.1 Removal of Hazardous Substances

Nonradiological and radiological hazardous substances will be removed from within and around the buildings/structures, as needed prior to demolition to facilitate compliance with ARARs and to meet

waste acceptance criteria for the Environmental Restoration Disposal Facility (ERDF) or other disposal facility. Refer to Section 1.3.2 for the list of the primary hazardous substances.

Removal and disposal of asbestos and ACM will be performed, to the extent practicable, in accordance with the substantive provisions of the *Clean Air Act and Amendments* (40 CFR 61, Subpart M) as identified in the Action Memorandum, which require special precautions to control airborne emissions of asbestos fibers during asbestos removal activities. Class II asbestos (e.g., transite siding) may be left on the outside of buildings/structures during demolition.

In situations where Class I Thermal System Insulation and/or Class II regulated asbestos-containing material (RACM) is inaccessible, removal poses significant worker safety issues, the building/structure is structurally unsound and/or in danger of imminent collapse, or removal requires initiation of demolition activities, emission controls similar to those addressed by EPA's Alternative Asbestos Control Method, EPA/600/R-08/094, "Comparison of the Alternative Asbestos Control Method and the NESHAP Method for Demolition of Asbestos-Containing Buildings," will be used. Notification to EPA will be provided prior to implementation of this alternative method. Notification may be in the form of email and will provide pertinent information such as an estimate of potential ACM that will remain prior to demolition, planned asbestos controls methods, etc. Controls such as the following will be implemented by incorporation into the work document.

- An accredited asbestos building inspector will perform a comprehensive inspection of the building/structure to be demolished.
- An estimate of the potential ACM that may reside in the building or structure.
- A competent person trained in asbestos regulations will provide oversight during active asbestos demolition activities.
- Track hoes, end loaders, and equivalent equipment and controlled explosives may be used during demolition in conjunction with wetting processes to minimize generation of dust.
- Buildings/structures to be demolished with RACM remaining will be thoroughly and adequately wetted with amended water (water to which a surfactant has been added) prior to demolition, during demolition, and during debris handling and loading. To the extent feasible, cavity areas and interstitial wall spaces will be wetted. A fixative or sealant such as "lockdown" may be used to reduce the potential for fiber and dust generation during the demolition process. Additionally, fixative or sealant will be used on demolition debris that will remain undisturbed for greater than 24 hours.
- Breakage of ACM will be minimized, to the extent practical, and ACM debris generated during that day will be containerized for disposal.
- The "National Emission Standards for Hazardous Air Pollutants" (NESHAP) asbestos standard of "no visible emissions" from RACM or ACM will be employed.
- In the event of inclement weather that will impede the ability to adequately wet the structure, demolition activities will be delayed or halted.
- Worker protection requirements will be followed. Personal protection equipment (PPE) will either be disposed of as RACM or decontaminated in accordance with the Occupational Safety and Health Administration (OSHA) practices.
- Potentially contaminated water will be controlled during demolition. Impervious surfaces will be thoroughly washed with water following completion of the asbestos-related activities.

- Upon the removal of demolition debris, bare soil within the asbestos-related demolition area will be excavated to a minimum depth of 7.62 cm (3 in) or until no debris is found. If berms or other run-off controls were used to contain water, they will be removed and disposed of as potentially asbestos-contaminated.

In instances where beryllium-contaminated materials may be present, special controls for beryllium will be necessary. Beryllium-contaminated materials will be managed in a manner that ensures worker protection. Prior to demolition, beryllium contamination may be fixed in place, as required.

Known liquid PCBs will be removed from buildings/structures prior to demolition. Other PCBs will only be removed as needed prior to demolition to facilitate proper disposal in accordance with ARARs and the waste acceptance criteria for ERDF or other receiving facility. PCB surface coatings and PCB spills (e.g., dried paints, adhesives) on concrete and other materials (both porous and non-porous materials) may be stabilized or fixed in place prior to demolition and the resulting demolition debris disposed as PCB bulk product waste or PCB remediation waste, as appropriate.

Where slabs or below-grade structures with suspected PCBs will be left in place, sampling may be performed to determine if potentially previously contaminated surfaces meet the substantive PCB decontamination standards of 40 CFR 761.79 without further action. When such sampling is performed, the results will be used to determine the TSCA status of the slab or structure to be left in place. If the results of sampling indicate presence of PCB contamination above applicable levels from 40 CFR 761, the contamination will be removed from the slab or structure to be left in place, if practicable, in accordance with substantive standards of 40 CFR 761.79(b) or (c). Materials separated from the contaminated slab or structure will be disposed as PCB waste. Subsequent sampling of the slab or structure to be left in place will be performed after decontamination. When decontamination is achieved to below applicable levels of 40 CFR 761.79, the slab or structure will no longer be subject to TSCA. If decontamination methods other than those addressed in 40 CFR 761.79(b) or (c) are determined necessary, concurrence of the alternate decontamination approach would be obtained from EPA prior to implementation. If decontamination is impracticable or unachievable, the contractor may consult with the On Scene Coordinator regarding the slab or structure to determine if placement of the slab or structure into waste information data system (WIDS) site is appropriate. If so, the site will be identified by DOE as a new site under the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989), with concurrence by Ecology and EPA.

Mercury-containing equipment (e.g., switches, gauges, and thermometers), refrigerants, lubricants, caustics, sodium vapor and mercury vapor lights, and any chemical containers will be removed and disposed or will be recycled.

Other hazardous substance contamination on surfaces or embedded in the structural materials, such as lead paint, heavy metals (e.g., cadmium and arsenic), and creosote, may be fixed in place prior to demolition and the resulting structural materials disposed as solid, hazardous or mixed waste, as appropriate, depending on the levels of contamination and waste characterization results.

2.2.2.2 Decontamination Activities

Decontamination of equipment, waste containers, etc. to support this removal action will generally be performed using dry methods (e.g., brushing or wiping, high-efficiency particulate air [HEPA]-filtered vacuum cleaners) to the extent possible. When the use of wet methods (e.g., water wash, pressure washers) is required to achieve decontamination objectives, the associated water or cleaning solutions will be collected, and work will be conducted by trained site workers in accordance with the following best management practices.

- Decontamination activities will be performed within the area of contamination.
- The amount of water used to clean equipment will be minimized, using raw or potable water.
- Soaps, detergents, or other cleaning agents may be added to wash water as long as there are no regulated levels of constituents present.

In some instances, more aggressive equipment decontamination methods (e.g., grinding or wet grit blasting) may be used for equipment decontamination if other methods fail, and will also be conducted by trained site workers using best management practices to minimize the potential for airborne contamination and waste generation.

The project may also opt to perform other methods of equipment washing and/or decontamination for a completed site (e.g., wrap the equipment for transfer to a decontamination pad, provide for a temporary facility at the site to collect wash water, or fix the contamination to the equipment). Decontamination fluid/wash water that is collected will be managed in accordance with Section 4.2 of this RAWP.

2.2.2.3 Demolition Activities

Demolition of building and structures will include removal of above-grade structures. The majority of the demolition will require the use of heavy equipment (e.g., excavator with various attachments) to demolish the structures. Other standard industry or conventional demolition practices also may be used (e.g., hydraulic shears with steel shear jaws, concrete pulverizer jaws or breaker jaws, cranes with wrecking ball, pneumatic hammers, mechanical saws, cutting torches, and/or controlled explosives). Demolition methods will be selected based on the structural elements to be demolished, remaining contamination, location, and integrity of the structure. Controls such as portable ventilation filter units, HEPA-filtered vacuum cleaners, greenhouses, fogging agents, and/or water may be used to control dust generated from demolition activities. The amount of water used will be minimized to prevent ponding and runoff. Additional stormwater run-on and run-off controls may be implemented, as needed. Such controls, if applicable, will be described in the work packages.

Equipment and piping within and around the buildings/structures, including pumps, pipes, tanks, boilers, compressors, ductwork, electrical components, and other equipment may be removed, as necessary. Below-grade structures will be removed and disposed of in the same fashion as above-grade buildings and structures. However, if below-grade structures (including basements, pipes and utility systems) are not contaminated or may be decontaminated, they will optionally be left in place, void spaces backfilled, and brought to grade. Backfill will consist of clean fill materials and/or inert demolition waste from the above-grade structures. Piping and drains entering or exiting each building/structure below-grade will be plugged or grouted to prevent potential pathways to the environment. Depending on the configuration of the area to be excavated, shoring or sloping may be required to comply with safety requirements and to reduce the quantity of excavated soil. Excavations will be backfilled and/or contoured after removal action is completed.

There is potential for encountering contamination to surrounding soils during the course of decommissioning work. Soil that is contaminated with substances that are known or easily determined to be associated with normal building/structure operation or maintenance will be removed for disposal during building/structure demolition, as appropriate. Such excavation will be performed using an observational approach with visual inspections, radiological and chemical field screening, and focused judgmental sampling where appropriate. Depth of excavation in these situations will be determined by the on-scene coordinator in consultation with EPA and Ecology. Depth of excavation will be consistent with any anticipated remedial action to the extent practicable. Alternatively, if the contaminated soil has not

been removed the site will be identified by DOE as a new WIDS site under the Tri-Party Agreement, with concurrence by Ecology and EPA.

2.2.3 Stabilization

Upon completion of removal activities at a site, the site will be stabilized in a manner that will mitigate potential industrial safety hazards and not unduly hinder future remediation, should it be necessary.

2.2.4 Sampling Activities

As needed, sampling plans will be developed to support waste characterization and disposal activities. The EPA-developed data quality objectives process for data collection, sampling and sampling rationale will be used in developing such plans. Where process knowledge, historical analytical data, and radiological and chemical screening are sufficient to characterize waste for disposal, a sampling and analysis plan is not required.

2.2.5 Waste Disposal

Waste management and disposal activities will be performed in accordance with waste management ARARs identified in the Action Memorandum, DOE/RL-2010-22, and as discussed in Section 4.2 of this document.

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3 Safety and Health Management and Controls

This section describes safety and health management and controls that will be performed for the removal activities.

3.1 Emergency Management

The contractor's Emergency Management Program (including preparedness, planning, and response) contains the administrative responsibilities for compliance with DOE/RL-94-02, *Hanford Emergency Response Plan*, and all applicable DOE Orders. The Emergency Management Program establishes a coordinated emergency response organization capable of planning for, responding to, and recovering from industrial, security, and hazardous material incidents. Emergency action plans for contractor-managed hazardous facilities identify the capabilities necessary to respond to emergency conditions, provide guidance and instruction for initiating emergency response actions, and serve as a basis for training personnel in emergency actions for each facility.

The emergency response actions within the emergency action plan are provided for recognizing incidents and/or abnormal conditions, initiating protective actions, and making the proper notifications. Emergency response for this project will include required notification to the National Response Center for reportable quantity releases and on-scene coordinator notification for other emergency situations.

3.2 Safeguards and Security

Access to the Hanford Site is restricted. Access to each removal action area is controlled by the contractor using such items as fences and signs. Access requirements for employees, non-employees, and/or visitors are defined in a health and safety plan (HASP).

3.3 Safety and Health Program

The potential personnel and environmental hazards are those associated with the non-routine activities of D4 operations. The buildings/structures, and cleanup of miscellaneous debris that are the subject of this removal action were never used for radiological or chemical processing. However, these buildings, structures, and debris may be potentially contaminated with hazardous substances as a result of their proximity to Hanford Site contamination and based on the building/structure and debris components and contents (e.g., asbestos, paints, coatings, and so forth).

Because of the potential for these buildings/structures and debris to be contaminated with hazardous substances (both chemical and radiological), the HASP prepared for this action will address chemical, radiological, and physical hazards as described in the following subsections. The HASP will specify the physical and administrative controls and requirements for work activities for the protection of both personnel and the environment.

3.3.1 Worker Safety Program

The Integrated Safety Management System/Environmental Management System will be incorporated into all work activities. The program includes the following elements:

- Organizational structure specifying the official chain of command and the overall responsibilities of supervisors and employees
- Comprehensive work plan developed before work begins at a site to identify operations and objectives and to address the logistics and resources required to accomplish project goals

- HASP developed when workers could be exposed to hazardous substances
- Worker training commensurate with individual job duties and work assignments
- Medical surveillance program administered to comply with the Occupational Safety and Health
- Administration requirements (29 CFR 1910.120)
- Contractor's internal work requirements and processes
- Voluntary protection program.

3.3.2 Health and Safety Plan and Activity Hazards Analysis

A HASP will be prepared that defines the chemical, radiological, and physical hazards and specifies the controls and requirements for implementing D4 and debris cleanup work activities associated with this RAWP.

Access and work activities are controlled in accordance with approved work packages, as required by established internal work requirements and processes. A HASP addresses the health and safety hazards of each phase of site operation and includes the requirements for hazardous waste operations and/or construction activities, as specified in 29 CFR 1910.120. As part of work package development, a job or activity hazards analysis will be written to identify the hazards associated with specific tasks already not covered under a HASP. The elements included in a HASP are as follows:

- General overview of the hazards associated with the area
- List of employee training assignments
- List of PPE to be used at the work site
- Medical surveillance requirements
- Work site control measures
- Emergency response
- Confined space entry internal work requirements and processes
- Spill containment program.

A pre-job briefing will be held with the involved workers. This briefing will include reviews of the hazards that could be encountered and the associated requirements.

3.3.3 Radiological Controls and Protection

The radiological controls and protection program is defined in DOE-approved programs and contractor-approved internal work requirements and processes. The radiological controls and protection program implements the contractor's policy to reduce risks to safety or health to levels that are as low as reasonably achievable (ALARA) and to ensure the adequate protection of workers². The contractor's radiological protection program meets the requirements of 10 CFR 835. Appropriate dosimetry, PPE, ALARA planning, periodic surveys, and radiological control technical support will also be provided.

In addition to a HASP, a radiological work permit (RWP) will be prepared, as needed, for work in areas with potential radiological hazards. The RWP extends the Radiological Protection Program to the specific

² Worker safety and health standards are not environmental standards per se and therefore not potential ARARs. Instead, compliance with applicable safety and health regulations is required external to the CERCLA ARAR process. However, a discussion of the safety and health requirements is included in this appendix, as a result of the nature and importance of these standards.

work site or operation. All personnel assigned to the project and all work site visitors must strictly adhere to the provisions identified in HASP and RWP.

The standard contractor's controls for work in radiological areas are assessed as adequate to control project activities. These controls will identify the specific conditions and will govern the specific requirements for an activity, periodic radiation and contamination surveys of the work area, and periodic or continuous observation of the work by the radiological controls organization. The ALARA planning process will be used to identify shielding requirements, contamination control requirements, radiation monitoring requirements, and other radiation control requirements for the individual tasks conducted during the projects.

Measures also will be taken to minimize impacts to the environment during work activities. Section 4.3 of this RAWP addresses the controls to be used during project activities to address the potential release of the radionuclides into the environment, but not to the exclusion of 10 CFR 835 requirements. Radiological worker exposure will be monitored using approved occupational radiological protection methods.

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4 Environmental Management and Controls

4.1 Applicable or Relevant and Appropriate Requirement Compliance

The ARARs for this removal action are identified in the Action Memorandum, DOE/RL-2010-22. The key ARARs include waste management standards, standards controlling releases to the environment, and standards for protection of cultural and natural resources.

4.2 Waste Management Plan

A variety of waste streams will be generated under this removal action. It is anticipated that some of the waste will potentially be determined to be low-level waste (LLW). However, dangerous or mixed waste, PCB waste, and asbestos and asbestos-containing material also could be generated. The majority of the waste will be in a solid form. However, some liquid wastes might be generated. Waste management activities will be performed in accordance with the following ARARs:

- The *Atomic Energy Act of 1954* for management by DOE of radioactive waste.
- RCRA, as implemented by 40 CFR 260 through 268 and *Washington Administrative Code (WAC) 173-303* for management of dangerous waste. The identification, storage, treatment, and disposal of hazardous waste and the hazardous component of mixed waste are governed by RCRA. The State of Washington, which implements RCRA requirements under WAC 173-303, has been authorized to implement most elements of the RCRA program. The dangerous waste standards for generation and storage will apply to the management of any dangerous or mixed waste generated by the decommissioning activities at the Hanford excess industrial buildings/ structures and as a result of debris cleanup activities. Treatment standards for dangerous or mixed waste subject to RCRA land disposal restrictions (LDRs) are specified in WAC 173-303-140, which incorporates 40 CFR 268 by reference.
- TSCA includes standards for management of PCB waste. The disposal of PCB wastes are governed by regulations at 40 CFR 761. PCB wastes that are generated during decommissioning and debris cleanup activities will be disposed at ERDF or other appropriate facility in accordance with the substantive provisions of 40 CFR 761. PCBs also are considered underlying hazardous constituents under RCRA for waste that designates as dangerous or mixed waste, and thus could require treatment to meet WAC 173-303 and 40 CFR 268 requirements.
- The CAA, as implemented by 40 CFR 61, Subpart M. Removal and disposal of asbestos and ACM are regulated under the CAA (40 CFR 61, Subpart M). These regulations provide for special precautions to control environmental releases or exposure to personnel due to airborne emissions of asbestos fibers during removal actions. In situations where removal of RACM is impractical or infeasible prior to demolition, emission controls similar to those addressed by EPA's Alternative Asbestos Control Method³ will be used as described in Section 2.2.2.1.

Wastes generated through implementation of this removal action will be disposed of at ERDF, the preferred waste disposal facility, in accordance with the waste acceptance criteria (WCH-191, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*). Alternate onsite and/or offsite waste treatment or disposal facilities that meet 40 CFR 300.440 criteria may be considered if determined to be suitable.

³ USEPA (2008) "Comparison of the Alternative Asbestos Control Method and the NESHAP Method for Demolition of Asbestos-Containing Buildings," Publication No. EPA/600/R-08/094.

DOE may also identify certain wastes generated from activities under the scope of the NTCRA for use in remedial actions, such as backfill, under the barrier associated with the 221-U Facility (EPA 2005) remedy, if such wastes meet applicable criteria of the decision document. DOE would consult with Ecology and EPA for candidate wastes prior to decisions regarding such use (including identification of storage locations).

Waste management activities that may be addressed in the work packages include waste characterization, designation, staging, packaging, handling, marking, labeling, segregation, storage, transportation, and disposal and are briefly described in the following subsections.

4.2.1 Projected Waste Streams

Projected waste streams anticipated to be generated under this RAWP are identified as follows:

- Liquids (e.g., decontamination liquids)
- Miscellaneous solid waste (e.g., PPE, cloth, plastic, wipes, wood, equipment, tools, pumps, wire, metal casing, plastic piping, and sample returns)
- Spent/ excess chemicals/ reagents and used oils
- D4 debris (e.g., structural materials, concrete, wood, rebar, metal/plastic pipes, wire, equipment, pumps, tanks, boilers, compressors, ductwork, and electrical components)
- General construction debris, office/lunch waste.

4.2.2 Waste Characterization, Designation, and Disposal

Waste generated through implementation of this removal action will be characterized in accordance with the contractor's procedures and the waste acceptance criteria of the receiving facility. Characterization is performed using a variety of information that includes, but is not limited to, process knowledge, historical analytical data, sampling and analysis, and radiological and chemical screening.

Contractor personnel will assess the buildings, structures and debris before the demolition and removal activities begin and, as needed, during the removal action. As appropriate, radiological surveys will be performed using hand-held or other instruments or equipment.

Waste characterization information will be used to develop the following, as applicable:

- Contaminant identification
- Contaminant concentrations
- Waste treatment requirements
- Waste packaging and disposal requirements
- Worker health and safety precautions
- Decontamination requirements
- Operational precautions
- Waste acceptance documents
- Waste transportation documents.

4.2.2.1 Sample Waste

Screening and analysis of both solids and liquids may be conducted using offsite or Hanford Site laboratories. Samples from onsite laboratories may be returned to the area of contamination. Unused

samples and associated laboratory waste from offsite analyses will be managed by the laboratory in accordance with contract specifications. Waste from field screening and Hanford Site laboratories will be managed depending on whether it has been altered. Altered samples will be contained and disposed at ERDF or other appropriate facilities as authorized by EPA (e.g., 200 Area Effluent Treatment Facility [ETF]).

4.2.2.2 Waste Handling, Storage and Packaging

Non-bulk containers or packages of waste requiring tracking (e.g., hazardous, mixed) will be assigned a unique tracking number by a waste specialist. If a container is in poor condition, the contents will be transferred to a container in good condition.

Bulk waste may be placed in roll-off containers or haul trucks for ERDF disposal. The containers will be covered when waste is not being added or removed. Lightweight material (e.g., plastic and paper) will be bagged, if appropriate, prior to placement in the container to eliminate the potential for materials blowing out of the container or truck. Waste will be staged in the area of contamination or a site-specific waste storage area or at the ERDF, as appropriate.

Applicable packaging and pre-transportation requirements for dangerous or mixed waste generated by the removal action will be identified and implemented before movement of waste. Before being removed from the area of contamination or site-specific waste storage area, containers and haul trucks being released from radiologically controlled areas will meet exterior contamination limits. Other waste-type-specific handling and packaging requirements may be applicable and will be described in the contractor's work documents, as appropriate.

The building footprint area (BFA) is defined to include the individual building/structure footprint and the surrounding area suitable to support D4 of buildings/structures and excavations. Waste management locations outside of the BFA and within the onsite area will meet the substantive requirements of the ARARs. For waste management inside the BFA, safe and effective management practices will be established to ensure protection of human health and the environment during performance of demolition and related work.

For the buildings/structures addressed under this action, the onsite area is defined as the main industrial portion of the building/structure or group of buildings/structures, and includes ERDF container queues used under this work plan. Within the onsite area only the substantive provisions of the ARARs will be applied.

As an alternative to management within the BFA, waste that is not immediately transported to ERDF or other EPA-approved disposal facility may be stored in staging piles. Staging piles used for the onsite management of materials that designate as dangerous waste will be operated in accordance with substantive provisions of standards and design criteria prescribed in 40 CFR 264.554, paragraphs (d) through (k) as follows:

- Staging piles will be used only as part of this removal action for temporary storage at a facility and must be located within the contiguous property where the waste to be managed in the staging piles is oriented.
- The staging pile will be designed to prevent or minimize releases of hazardous wastes and hazardous constituents into the environment and minimize or adequately control cross-media transfer. To protect human health and the environment, this may include installation of berms, dust control practices, or using plastic liners or covers, as appropriate.

- The staging pile must not operate more than 2 years (measured from the first time remediation waste is placed in the pile), except when EPA grants an operating term extension. A record of the date when remediation waste was first placed in the staging pile must be maintained until final closeout of the site is achieved.
- Ignitable or reactive waste will not be placed in a staging pile unless it has been treated or mixed before being placed in the pile so that the waste no longer meets the definition of ignitable or reactive waste, or the waste is managed to protect it from exposure to any material or condition that may cause it to ignite.
- Incompatible wastes will not be placed in the same staging pile, unless the requirements in 40 CFR 264.17(b) have been met. The incompatible materials will be separated or the waste will not be piled on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to comply with 40 CFR 264.17(b).

Approval of this RAWP by EPA constitutes general authorization to operate staging piles during the execution of this removal action. Specific staging pile locations will be identified in project drawings and approved by EPA. Field operations of staging piles will be accomplished as described above.

Once the materials have been removed, to close out the staging pile, characterization of the residual soil will be performed as appropriate. In cases where staging piles for industrial waste sites are located in an uncontaminated area, the observational approach may be used. In situations where sampling is appropriate and results indicate presence of residual contamination, efforts will be made to remove such contamination.

4.2.2.3 Waste Profile

The contractor will provide waste characterization and necessary transport papers. Waste profiling for establishing values for the waste-tracking form may take place concurrently with removal action activities. Field-screening measurements may be used to obtain data to adjust the waste-tracking form. The waste profile may be adjusted (as necessary) through a combination of in-process field-screening methods, analytical laboratory analysis, and notification of the field engineer.

4.2.3 Waste Generation Management

Marking, labeling, segregation, and staging of waste containers will be performed or directed by the waste specialist. Wastes will be stored at a site specific waste container storage area or area of contamination, unless otherwise identified in contractor work packages. The following sections describe management of specific hazardous substances.

4.2.3.1 Miscellaneous Solid Waste

Miscellaneous solid waste, including rubblized demolition materials, debris, and soils will be managed as appropriate for the nonradiological and radiological contaminants present or suspected to be present, if any. Miscellaneous solid waste that has contacted suspect dangerous or suspect mixed waste will be treated as such. Field screening will be used to segregate radioactive waste from no radiation added (nonradioactive) waste. Container(s) will be properly marked and labeled. The containers will be segregated as appropriate, then staged at the designated waste container storage area or within the area of contamination. Miscellaneous solid waste will be dispositioned based on waste characterization information.

4.2.3.2 Hazardous/Dangerous Waste, Low-Level Waste, and Mixed Waste

These wastes will be packaged, stored, and transported to prevent dispersion and public exposures. Waste-specific storage and packaging requirements will be described in the contractor's work documents, as appropriate.

4.2.3.3 Asbestos Waste

Removal, handling, packaging, and disposal of asbestos and ACM will be performed in accordance with substantive provisions of 40 CFR 61.145(c), 40 CFR 61.150, 29 CFR 1926.1101, and the contractor's procedures for ACM removal.

4.2.3.4 PCB Waste

PCB waste that meets ERDF waste acceptance criteria will be sent to ERDF for disposal in accordance with the substantive requirements of 40 CFR 761.

PCB surface coatings (e.g., dried paints, adhesives) could be present on various surfaces. Such coatings will meet the ERDF waste acceptance criteria at any PCB concentration. Therefore, in some situations, demolition debris (e.g., concrete and other structural materials) potentially coated, painted, or contaminated with PCBs may be conservatively disposed as PCB bulk product waste or PCB remediation waste, as appropriate, in lieu of sampling to determine the presence or absence of PCBs on the materials.

The PCB bulk product waste and/or PCB remediation waste will be managed in accordance with applicable substantive provisions of 40 CFR 761 upon removal from the BFA to a centralized or other established storage area within the CERCLA onsite area (following approval of a centralized area by EPA). Containers managed outside the BFA in identified onsite areas will be marked with a large PCB mark (ML) marking (CAUTION - CONTAINS PCBs) consistent with 40 CFR 761.

Areas outside the BFA containing packaged PCBs will be marked with signs posting "DANGER-UNAUTHORIZED PERSONNEL KEEP OUT" at each entrance. The ML marking will also be posted in accordance with 40 CFR 761.

Staging of containerized PCB waste will be performed in a manner that satisfies the substantive provisions of 40 CFR 761.65(b). Containerized PCB waste may be staged outdoors in "overpack" containers. Although the "overpack" containers may not represent the typical concept of a "facility," they satisfy the substantive requirements for roof, walls, nonporous floors, and spill protection.

4.2.3.5 Equipment

Equipment used to support the removal action that contacts dangerous and/or mixed waste will be decontaminated as described in Section 2.2.2.2. If the equipment cannot be decontaminated, the equipment will be designated for disposal at the ERDF or other appropriate facility.

4.2.3.6 Decontamination Fluids

Decontamination fluids that meet the substantive provisions of existing Hanford state waste discharge permits may be discharged accordingly. Alternatively, decontamination fluids (water and/or non-dangerous cleaning solutions) generated from cleaning equipment and tools in the area of contamination may need to be contained, sampled, and as necessary transported, and discharged into the ETF or solidified for disposal at ERDF.

4.2.4 Management of Waste Containers

Waste containers, including the ERDF roll on/roll off containers, are inspected before use to ensure container integrity. The containers will be stored inside the applicable site-specific waste container

storage area or area of contamination. Containers awaiting analytical results will be marked and labeled as appropriate. Weekly inspections of the containers will be performed to document the integrity, container marking/labeling, physical container placement, storage area boundaries/identification/warning signs, and sign of any potential leakage. Containers showing signs of deterioration will be identified on the container inspection form and will be over packed or repackaged, as necessary.

Spills or releases will be reported as stated in Section 4.5. In the event of a spill or release, action will be taken to protect human health and the environment.

4.2.5 Final Disposal

Wastes generated through implementation of this removal action will be dispositioned at appropriate waste disposal facilities in accordance with the waste acceptance criteria of those facilities. The ERDF is the preferred disposal location for wastes meeting the ERDF waste acceptance criteria.

Waste that does not meet the ERDF waste acceptance criteria may be sent to an offsite facility (e.g., ETF) subject to the facility having received a determination of acceptability by the EPA, in accordance with the Off-Site Rule, 40 CFR 300.400, as applicable.

Aqueous waste determined to be LLW or designated as dangerous or mixed waste may be transported to the ETF for treatment, followed by discharge under Washington's State Waste Discharge Program. ETF is a RCRA-permitted unit authorized to treat aqueous waste streams generated on the Hanford Site and dispose of these streams at a designated state-approved land disposal facility in accordance with applicable requirements. Alternatively, liquids may be solidified for disposal at the ERDF if the waste meets the ERDF waste acceptance criteria.

Waste designated as PCB remediation waste or PCB bulk product waste will be disposed at ERDF, if it meets the waste acceptance criteria. PCB waste that does not meet ERDF waste acceptance criteria may be retained onsite or at a PCB storage area and will be transported for future disposal at an appropriate disposal facility.

4.2.6 Waste Disposal Records

Original Onsite Waste Tracking Forms will be sent to ERDF with each container shipped. Original sample reports and a copy of the Original Onsite Waste Tracking Form for each ERDF container will be retained and forwarded to the assigned waste specialist for inclusion in the project file following final waste disposition.

4.2.7 Waste Treatment

Treatment (e.g., solidification, separation, elementary neutralization, mercury amalgamation, size reduction, repackaging) of certain waste streams may be necessary to provide safe transport, meet waste disposal facility waste acceptance criteria, and/or to address LDR. When necessary, treatment may be conducted at the generating site, ERDF or at an EPA approved offsite facility (e.g., ETF). Offsite treatment must be performed at a facility approved by the EPA in accordance with 40 CFR 300.440. Return of treated waste from offsite treatment facilities for disposal at the ERDF requires authorization from DOE.

4.2.8 Waste Minimization and Recycling

Waste minimization practices will be followed to the extent technically and economically feasible during waste management. Introduction of clean materials into a contamination area as well as contamination of clean materials will be minimized to the extent practicable. Emphasis will be placed on source reduction to eliminate or minimize the volume of waste generated.

Materials released offsite for disposal/recycle must be certified free of contamination in accordance with DOE guidance for non-real property. Waste materials meeting this criterion are not considered CERCLA waste and therefore are not subject to the 40 CFR 300.440 offsite acceptability determination.

4.3 Airborne Emissions

Airborne emissions associated with this removal action will be minimized by the use of appropriate work controls. Airborne releases of contaminants during these removal actions will be controlled in accordance with DOE radiation control and substantive air pollution control standards in order to maintain emissions of air pollutants at the Hanford Site to ALARA levels.

4.3.1 Radiological Airborne Emissions

Although not expected, radioactive contamination may be encountered, resulting in a potential for airborne emissions from certain removal activities performed during this removal action. While the D4 activities and cleanup of miscellaneous debris will be conducted over a period of several years, for purposes of conservatism in calculating the maximum potential for airborne emissions and related impacts, the calculations are based upon an assumption that all removal activities will occur within a single year. Based on historical data reviews and current radiological surveillance information, nearly all of the buildings/structures identified within this RAWP are believed to contain no measurable radiological contamination, and those that do will contain very little. A summary of the maximum estimated building/structure radiological inventory and resultant environmental airborne releases and their impacts is provided in Appendix A. Contamination that may be encountered during the removal activities, including demolition and excavation, is addressed by the estimates in Appendix A.

The emissions estimates are based on the primary isotopes that could be encountered for release and that would comprise the isotopes most responsible for offsite dose. It is recognized that essentially any isotope may be present, but those isotopes other than the primary list would occur in very limited quantities such that their impacts would not affect the overall numeric estimates of public dose. Characterization data will be used to confirm the adequacy of the conservative inventory assumptions for the buildings, structures, and miscellaneous debris and associated emissions estimates. If unusual or excessive radiological contamination is encountered, beyond the conservative estimates, the on-scene coordinator will be consulted and activities reevaluated or deferred, as appropriate to ensure potential impacts are assessed for substantive compliance with the controlling standards.

The removal action will be evaluated and tracked to determine the potential for radionuclide airborne emissions from any point source or diffuse/fugitive source that may be encountered. To accomplish this, radiological field survey data and/or other characterization data will be utilized to estimate the total (unabated) potential release (in curies) for comparison with the upper bounds represented by the maximum estimated inventory and associated release estimates presented in Appendix A. The exposure (dose) estimates in Appendix A are based on inventory values and assumed fractions released, and have been calculated using the DOE guidance for calculating potential-to-emit (PTE) radiological releases and doses (DOE/RL-2006-29, *Calculating Potential-to-Emit Radiological Releases and Doses*), or modeled using the CAP88 PC computer model (EPA-approved versions). As presented in Appendix A, the maximum estimated exposure to any public individual would be 8.1E-02 mrem/year total effective dose equivalent (TEDE) or less from any one building/structure removal activity, including associated excavation. This is well below the overall Hanford Site standard of 10 mrem/year TEDE.

Airborne emissions control and emissions monitoring requirements for any radiological air emissions will be provided as required, based on the calculated/modeled value of the potential emissions and resultant public exposure, and will be included in the contractor's work packages.

4.3.2 Criteria/Toxic Emissions

The primary source of emissions resulting from this removal action will be fugitive particulate matter. In accordance with WAC 173-400-040(3) and (8), reasonable precautions will be taken to (1) prevent the release of air contaminants associated with fugitive emissions resulting from demolition, materials handling, or other operations; and (2) prevent fugitive dust from becoming airborne from fugitive sources of emissions.

Operation of trucks and other diesel-powered equipment during these removal activities would be expected, in the short term, to introduce quantities of sulfur dioxide, nitrogen dioxide, particulates, and other pollutants to the atmosphere, typical of similar-sized construction projects. These releases would not be expected to cause any air quality standards to be exceeded. Dust generated during removal activities would be minimized by watering or other dust-control measures, e.g., use of fixatives. Vehicular and equipment emissions will be controlled and mitigated in compliance with the substantive standards for air quality protection that apply to the Hanford Site. These techniques are considered reasonable precautions to control fugitive emissions as required by the substantive requirements.

Emissions that would be subject to the substantive applicable requirements of WAC 173-460 after use of treatment technologies are not anticipated to be a part of this removal action.

Treatment of some waste encountered during the removal action may be required to meet the ERDF waste acceptance criteria. In most cases, the type of treatment anticipated will consist of solidification/stabilization techniques such as macroencapsulation or grouting, and WAC 173-460 will not be considered an ARAR because the work will not result in the emission of toxic air pollutants at regulated levels. If more aggressive treatment is required that would result in the emission of regulated air pollutants above de minimis emission values in WAC 173-460-150, the substantive requirements of WAC 173-400-113(2) and WAC 173-460-060 will be evaluated to determine applicability and satisfy substantive requirements determined to be ARAR.

4.3.3 Asbestos Emissions

Removal and disposal of asbestos and ACM are regulated under the CAA. The substantive provisions of these regulations provide for special precautions to prevent environmental releases or exposure to personnel of airborne emissions of asbestos fibers during removal actions. In situations where removal of RACM is impractical or infeasible prior to demolition, emission controls similar to those addressed by EPA's Alternative Asbestos Control Method will be used as discussed in Section 2.2.2.1.

4.3.4 Emission Limits and Controls

Based on analysis of the potential emissions and analysis of available control technologies, the following controls have been selected for use during the removal action.

- Water will be applied, as needed, during any excavation and backfilling/recontouring activities, to spray for suppression of fugitive emissions including dust.
- Fixatives will be applied to structural materials, debris and equipment, and/or contaminated soil as needed, to minimize airborne contamination during the removal action activities for fugitive emissions and dust. Fixative application techniques may include spraying, fogging, brushing on, pouring, or some other method, as necessary.
- Fixatives or cover material (e.g., soil, gravel, etc.) will be applied to disturbed contaminated soils, when field activities will be inactive more than 24 hours except as noted in the next bullet.

- If a fixative has already been applied and the fixed contaminated items will remain undisturbed, further use of fixatives will not be needed. The fixatives or other controls will not be applied when the contaminated items are frozen, or it is raining, snowing, or other freezing precipitation is falling.
- Field activities will be temporarily ceased and the area placed in a safe configuration if airborne contamination control measures are not expected to be adequate, based on site conditions (e.g., excessive wind). Additionally, a fixative will be applied to the demolition site and debris piles as needed to help control dust and radiological and non-radiological contaminants.
- Waste packages will remain closed, except during packaging and waste inspection activities, once they are staged.
- Operational limits for removable or transferable radioactive contamination levels will be established in the activity work packages and associated radiation work plans. Fixatives or other physical controls will be employed if removable or transferable contamination levels (other than specks of contamination) above 100,000 disintegrations per minute (dpm) per 100 cm² beta/gamma or exceeding 2,000 dpm per 100 cm² alpha are measured or expected.

4.3.5 Monitoring Requirements

As presented in Appendix A, even the conservative assumptions for upper bounding potential releases result in minor potential for emissions of radionuclides. Therefore, the substantive monitoring requirements will entail periodic confirmatory measurement to verify low emissions, and this may be achieved by various methods including radiological field surveys, engineering calculations, or ambient air monitoring.

Many of the buildings/structures identified within this RAWP are believed to have little or no radiological contamination based on historical data reviews. The PTE from buildings/structures with no appreciable radiological contamination is negligible. As an alternate approach (i.e., in lieu of applying an emission estimate), a summary of the facility environmental hazards may be provided to EPA for review and approval confirming that an emission estimate is not required. In situations where such approval is granted, no radiological controls would be needed for associated D4 activities. If, however, contamination is discovered during the D4 activities, an emissions estimate will be prepared and provided to EPA for review and approval.

4.4 Liquid Effluents

Liquid effluents may be generated during the removal action activities (e.g., decontamination solutions, water sprays for dust suppression). Liquid effluents will be managed in a manner consistent with substantive provisions in existing Hanford state waste discharge permits to minimize potential for impacts to groundwaters from the removal action.

Discharge to the environment of liquid effluents will be controlled during removal activities through the use of standard industry practices. Water spray for dust suppression will be used in a manner that minimizes the potential for ponding or runoff that could result in the spread of hazardous substances.

4.5 Notifications

Notification will be provided to the National Response Center (NRC) in accordance with 40 CFR 302 and company procedures for any previously unidentified discovery of a release of a hazardous substance into the environment in excess of a reportable quantity. Notification will also be provided to the NRC for unanticipated releases (i.e., releases that are not covered by the removal action) of hazardous substances to the environment.

Notification will be provided to the community emergency coordinator for the local emergency planning committee and to the State Emergency Response Commission will be provided if required by 40 CFR 355.

Notifications provided to the NRC and the community emergency coordinator will also be provided to the on-scene coordinator.

Notification will be provided for information purposes to the company SPOC regarding UIC wells identified during (and/or before or after) the implementation of this RAWP. The notification will identify to the SPOC the location of the UIC well(s) in adequate detail so the well can be tracked by the company for future purposes. The notification to the SPOC can be provided either via telephone or email.

4.6 Cultural and Ecological Resources

Cultural and ecological resource reviews will be performed, as appropriate, before starting the removal action activities to identify any potential impacts. The cultural and ecological resource reviews will be conducted in accordance with DOE requirements. If potential impacts are discovered by these reviews, an appropriate mitigation action plan will be developed and implemented. The following sections provide further detail for the implementation of these reviews.

4.6.1 Cultural Resources

A *National Historic Preservation Act*, Section 106, cultural resource review (CRR) will be conducted to address the demolition of the miscellaneous buildings and structures on the Hanford Site. All of the buildings/structures are located in areas that have been extensively disturbed by past construction activities. Hanford Site buildings/structures have been evaluated for their National Register of Historic Places eligibility as part of DOE/RL-97-56, *Manhattan Project and Cold War Era Historic District Treatment Plan* (Treatment Plan). Some buildings/structures have been determined to be contributing properties to the Manhattan Project/Cold War Era Historic District with mitigation in the form of documentation required. The Treatment Plan also requires that walkthroughs be completed to identify artifacts that are of educational and interpretive value. Before field activity begins, each building/structure requiring documentation will be evaluated for the following.

1. The type of documentation required for each building/structure (Historic Property Inventory Form or Expanded Historic Property Inventory Form).
2. The status of that documentation. In addition, as appropriate, walkthroughs of the buildings/structures will be conducted before demolition to finalize all mitigation requirements. CRR documentation requirements for any specific building/structure will be identified/completed before demolition activities begin.

Appropriate CRR(s) will also be conducted to address the cleanup of debris. A graded CRR could be developed to address cleanup of the debris that has been identified to date, as well as those that may be identified in the future, to ensure that adverse effects on potential archaeological sites are avoided. CRR documentation requirements, including any necessary site-specific field evaluations, will be identified/completed before debris cleanup begins.

Impacts on cultural resources in the vicinity of the removal actions will continue to be mitigated in accordance with DOE/RL-98-10, *Hanford Cultural Resources Management Plan*.

4.6.2 Ecological Resources

Ecological reviews will be carried out before work begins in areas where there is a potential for adverse impacts to sensitive or rare biological resources, consistent with existing routine procedures (DOE/RL-95-11, *Ecological Compliance Assessment Management Plan*). Because most of the demolitions will occur in areas that have been previously disturbed, the potential for effects on sensitive ecological resources is expected to be minimal.

All of the buildings/structures have the potential to support nesting by migratory birds, and building/structure-specific surveys must be conducted at each building/structure prior to decommissioning. Project engineers will consult with the ecological compliance staff in advance of planned decommissioning activities to allow for sufficient surveys. If nesting migratory birds are observed, decommissioning will be delayed until after the end of the nesting season. Many of the buildings/structures also have the potential to provide roosting habitat for various species of bats. Communal roost sites for many bat species are considered a high conservation priority for the Washington Department of Fish and Wildlife. Surveys for bats must be performed at each building/structure prior to decommissioning. If any are found, appropriate mitigation should be developed in consultation with qualified bat biologists. Spring and summer are the preferred seasons to survey for bats. No plant or animal species listed as threatened or endangered under the federal *Endangered Species Act*, or candidates for such protection, are known to be affected by the buildings/structures decommissioning. Very little native or natural habitat is present in the vicinity of the buildings/structures slated for decommissioning. However, care will be taken to avoid or minimize damage to any vegetation, especially shrubs or trees that are in the vicinity of the buildings/structures. Workers also will avoid all wildlife that may be found in and around the buildings/structures.

Appropriate ecological surveys of debris cleanup sites also will be conducted before field activities begin. Procedures to avoid or mitigate damage to sensitive areas identified during the reviews will be established before work begins, including activities occurring on the Hanford Reach National Monument environs. For example, it is expected that many of the sites will have relatively small collections of material that could be removed without undue disturbance of the surrounding areas. However, debris cleanup that will require travel of vehicles off maintained roadways or the use of other heavy equipment and/or excavation will require site-specific evaluation and review of the biological resources at the time the work is scheduled. If off-road travel is necessary during cleanup, additional disturbance will be minimized to the extent possible and planned to avoid any sensitive ecological resources identified within the area.

Impacts on ecological resources in the vicinity of the removal actions will continue to be mitigated in accordance with DOE/RL-96-32, *Hanford Site Biological Resources Management Plan* and DOE/RL-96-88, *Biological Resources Mitigation Strategy*.

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5 Project Administration

The following sections describe the management approach for implementation of the removal action, including schedule summary information, a description of the project team, training and qualifications, quality assurance and post-removal action activities.

5.1 Cost Summary

The projected cost, as identified in the Action Memorandum, is identified in Table 5-1.

Table 5-1. Summary of Present Worth Cost Estimate

Alternative	Present-Worth Cost
Alternative 3: Decontamination, Deactivation, Decommissioning, and Demolition (D4) of Buildings/Structures and Cleanup of Debris	\$96,000,000

Notes:

Accuracy range of the cost estimate is -30% to +50%.

5.2 Schedule

This removal action is expected to begin with the general decommissioning activities following issuance of this RAWP, which is anticipated to occur by April 21, 2010. As discussed in Section 1.2, the intent of this removal action is to allow the addition, or deletion, of buildings and structures to the scope of the removal action, as appropriate, and with Ecology and EPA concurrence. Because of the possibility that the scope may expand to accommodate additional buildings and structures, the schedule for completion of the NTCRA will continue until completion of D4 of the buildings/structures and cleanup of miscellaneous debris included within the contractor's authorized scope of work.

5.3 Project Team

The term "project team" includes the individuals working to accomplish the removal action. Accordingly, the project team includes the lead regulatory agencies, EPA and Ecology; the lead agency, DOE; the contractor removal action manager, site project manager, and environmental manager, all agents of DOE; and other contractor staff and subcontractors. The HASP contains the list of the key project team members, their roles and responsibilities, and the names of the respective individuals. As the HASP is kept up-to-date with current information, this information is not duplicated in this work plan.

5.4 Change Management

If a change arises that results in a fundamental change to the selected response action that is not within the scope of work, another engineering evaluation/cost analysis (EE/CA) or an EE/CA addendum and supporting documentation will be prepared to allow DOE to select a revised response action.

Established configuration/change control processes ensure that proposed changes are reviewed in relation to the specified commitments. If a breach of these commitments is discovered, work ceases so stabilization and/or recovery actions may be identified and implemented as appropriate. Change management will comply with the appropriate contractor's procedures.

Determining the significance of the change is the responsibility of DOE. Contractor management is responsible for tracking changes and obtaining appropriate reviews by contractor staff. Contractor management will discuss the change with DOE, and DOE will then discuss the type of change that is necessary with EPA and Ecology. Appropriate documentation will follow.

5.5 Personnel Training and Qualifications

During the performance of project activities, the experience and capabilities of the operating staff will be extremely important in maintaining worker and environmental safety. Day-to-day knowledge of ongoing operations, month-to-month understanding of conditions encountered, and lessons learned will be utilized for continued safe operations.

Training requirements will ensure that personnel have been instructed in the technologies to work safely in and around radiological areas, and to maintain their individual radiation exposure and the radiation exposures of others ALARA. Standardized core courses and training material will be presented, and site-specific information and technologies will be added to adequately train workers. Records of required training will be maintained in accessible files.

Health physics workers will be required to have completed and be current in radiological control technician qualification training. These training courses require the successful completion of examinations to demonstrate understanding of theoretical and classroom material.

Specialized training will be provided as needed to instruct workers in the use of nonstandard equipment, in the performance of abnormal operations, and in the hazards of specific activities. Specialized training could be provided by on-the-job training activities, classroom instruction and testing, or pre-job briefings. The depth of training in any discipline will be commensurate with the degree of the hazard(s) involved and the knowledge required for task performance.

Some activities will require the acquisition of expert services as opposed to project staff training.

The contractor training program will provide workers with the knowledge and skills necessary to safely execute assigned duties. A graded approach will be used to ensure that workers receive a level of training commensurate with their responsibility and that complies with applicable requirements. Specialized employee training will include pre-job safety briefings, plan-of-the-day meetings, and facility/work site orientations. Training and qualifications will be determined as required by job assignment for work activities.

The HASP, RWP, and activity hazards analysis will include specific requirements for project activities being conducted, which will include personal protective equipment and required training for project personnel.

5.6 Quality Assurance Program

Overall quality assurance for the RAWP will be planned and implemented in accordance with 10 CFR 830, Subpart A, "Quality Assurance Requirements;" EPA/240/B-01/003, *EPA Requirements for Quality Assurance Project Plans*, EPA QA/R-5; and EPA SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition, Final Update III-A (EPA 1999). The quality assurance activities will use a graded approach based on the potential impact on the environment, safety, health, reliability, and continuity of operations. Other specific activities will include quality assurance implementation, responsibilities and authority, document control, quality assurance records, and audits.

5.7 Post-Removal Action Activities

If soil contamination is discovered that is not removed, the process identified in Section 2.2.2.3 will be followed.

5.7.1 Post-Removal Action Sample Collection

If contamination is discovered, post-removal action sample collection may be performed, if required by the process identified in Section 2.2.2.3.

5.7.2 CERCLA Cleanup Documentation

Removal activities completed as part of this removal action will be documented on a Facility Status Change Form. The form will provide a summary of the actions taken, the “as-left” condition of the area, the characterization data collected during the removal action, and an assessment of the underlying soil as applicable. The form will be approved by DOE to document completion of the removal action. The form and instructions are provided in Appendix B.

Field investigations (visual inspections, radiological and/or chemical field screening, etc.) will be conducted throughout the D4 process to assess potential contamination. If contamination to the surrounding soils is known, verified, or suspected, excavation will be conducted as discussed in Section 2.2.2.3, or the site will be identified by DOE as a new WIDS site under the Tri-Party Agreement with concurrence from Ecology and EPA.

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6 References

- 10 CFR 830, Subpart A, “Quality Assurance Requirements,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div6&view=text&node=10:4.0.2.5.26.1&idno=10>
- 10 CFR 835, “Occupational Radiation Protection,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=c3cf39c6dd650f660e6026673ed9069d&rgn=div5&view=text&node=10:4.0.2.5.27&idno=10>.
- 29 CFR 1910.120, “Hazardous Waste Operations and Emergency Response,” *Code of Federal Regulations*, as amended. Available at: http://edocket.access.gpo.gov/cfr_2005/julqtr/pdf/29cfr1910.120.pdf.
- 29 CFR 1926.1101, “Asbestos,” *Code of Federal Regulations*. Available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10862&p_table=STANDARD S.
- 40 CFR 61, Subpart M, “National Emission Standard for Asbestos,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div6&view=text&node=40:8.0.1.1.1.13&idno=40>.
- 40 CFR 260, “Hazardous Waste Management System: General,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=f11ec333d6f059bc4460e6b1e81716f9&rgn=div5&view=text&node=40:25.0.1.1.1&idno=40>
- 40 CFR 261, “Identification and Listing of Hazardous Waste,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=f11ec333d6f059bc4460e6b1e81716f9&rgn=div5&view=text&node=40:25.0.1.1.2&idno=40>
- 40 CFR 262, “Standards Applicable to Generators of Hazardous Waste,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=f11ec333d6f059bc4460e6b1e81716f9&rgn=div5&view=text&node=40:25.0.1.1.3&idno=40>
- 40 CFR 263, “Standards Applicable to Transporters of Hazardous Waste,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=f11ec333d6f059bc4460e6b1e81716f9&rgn=div5&view=text&node=40:25.0.1.1.4&idno=40>
- 40 CFR 264, “Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=f11ec333d6f059bc4460e6b1e81716f9&rgn=div5&view=text&node=40:25.0.1.1.5&idno=40>
- 40 CFR 265, “Interim Status Standards for Owners and Operators of Hazardous Waste Treatment Storage, and Disposal Facilities,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=f11ec333d6f059bc4460e6b1e81716f9&rgn=div5&view=text&node=40:25.0.1.1.6&idno=40>

- 40 CFR 266, “Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities,” *Code of Federal Regulations*. Available at http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr266_main_02.tpl
- 40 CFR 267, “Standards for Owners and Operators of Hazardous Waste Facilities Operating Under a Standardized Permit,” *Code of Federal Regulations*. Available at <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div5&view=text&node=40:26.0.1.1.2&idno=40>
- 40 CFR 268, “Land Disposal Restrictions,” *Code of Federal Regulations*. Available at http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr268_main_02.tpl
- 40 CFR 300, “National Oil and Hazardous Substances Pollution Contingency Plan,” *Code of Federal Regulations*. Available at: <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?type=simple;c=ecfr;cc=ecfr;sid=953c6c09ccef0ce0a4734624a3bc2c4;region=DIV1;q1=40%20CFR%20300;rgn=div5;view=text;idno=40;node=40%3A27.0.1.1.1>.
- 40 CFR 302, “Designation, Reportable Quantities, and Notification,” *Code of Federal Regulations*. Available at <http://homer.ornl.gov/rq/302.pdf>.
- 40 CFR 355, “Emergency Planning and Notification,” *Code of Federal Regulations*. Available at http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr355_main_02.tpl
- 40 CFR 761, “Polychlorinated Biphenyls (PCBs) Manufacturing Processing, Distribution in Commerce, and Use Prohibitions.” Available at http://www.access.gpo.gov/nara/cfr/waisidx_07/40cfr761_07.html.
- 40 CFR 761, “Polychlorinated Biphenyls (PCBs) Manufacturing Processing, Distribution in Commerce, and Use Prohibitions.” Available at: http://www.access.gpo.gov/nara/cfr/waisidx_07/40cfr761_07.html.
- Atomic Energy Act of 1954*, 42 USC 2011 et seq. Available at: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0980/ml022200075-vol1.pdf#pagemode=bookmarks&page=14>.
- Clean Air Act*, 42 USC 7401, et seq. Available at <http://www.epa.gov/air/caa/>.
- Comprehensive Environmental Response, Compensation and Liability Act of 1980*, 42 U.S.C. 9601 et seq. Available at: <http://www.epa.gov/superfund/policy/cercla.htm>.
- DOE/RL-94-02, 1999, *Hanford Emergency Management Plan*, latest revision, U.S. Department of Energy, Richland Operations Office, Richland, Washington. [http://prc.rl.gov/rapidweb/QA/docs/86/docs/09-SES-0097%20-%20DOE-RL%2094-02\[1\].pdf?CFID=478668&CFTOKEN=31726211&jsessionid=be3042ab650126c79ab6211c127175a10502](http://prc.rl.gov/rapidweb/QA/docs/86/docs/09-SES-0097%20-%20DOE-RL%2094-02[1].pdf?CFID=478668&CFTOKEN=31726211&jsessionid=be3042ab650126c79ab6211c127175a10502).
- DOE/RL-95-11, 1995, *Ecological Compliance Assessment Management Plan*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at <http://www2.hanford.gov/arpir/?content=findpage&AKey=D196015539>.

- DOE/RL-96-32, 2001, *Hanford Site Biological Resources Management Plan*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at <http://www.pnl.gov/ecomon/docs/brmap/BRMaP.pdf>.
- DOE/RL-96-88, 2003, *Biological Resources Mitigation Strategy*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. <http://www.pnl.gov/ecomon/docs/BRMiS.pdf>.
- DOE/RL-97-56, *Manhattan Project and Cold War Era Historic District Treatment Plan*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at <http://www-old.hanford.gov/doe/history/docs/r197-56/r197-56.htm>.
- DOE/RL-98-10, 2003, *Hanford Cultural Resources Management Plan*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at <http://www-old.hanford.gov/doe/history/?history=rmp>.
- DOE/RL-2006-29, *Calculating Potential-to-Emit Radiological Releases and Doses*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at <http://www2.hanford.gov/arpir/?content=findpage&AKey=0904290337>.
- DOE/RL-2010-14, *Engineering Evaluation/Cost Analysis for General Hanford Site Decommissioning Activities*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at <http://www2.hanford.gov/arpir/?content=findpage&AKey=0084795>.
- DOE/RL-2010-22, *Action Memorandum for General Hanford Site Decommissioning Activities*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington. Available at <http://www.hanford.gov/?page=91&parent=0>.
- Endangered Species Act of 1973*, 16 USC 1531 et seq. Available at <http://www.fws.gov/laws/lawsdigest/ESACT.html>.
- EPA, 1999, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition; Final Update III-A, as amended, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C. Available at: <http://www.epa.gov/SW-846/main.htm>.
- EPA, 2005, *Record of Decision 221-U Facility (Canyon Disposition Initiative) Hanford Site, Washington*. Available at <http://www.epa.gov/superfund/sites/rods/fulltext/r2005100003104.pdf>
- EPA, 2006, *Updated User's Guide for CAP88-PC, Version 3* <http://www.epa.gov/rpdweb00/assessment/CAP88/index.html#version3>.
- EPA/240/B-01/003, 2001, *EPA Requirements for Quality Assurance Project Plans*, EPA QA/R-5, U.S. Environmental Protection Agency, Quality Assurance Division, Washington, D.C. Available at: <http://www.epa.gov/QUALITY/qs-docs/r5-final.pdf>.
- EPA/600/R-08/094, 2008, *Comparison of the Alternative Asbestos Control Method and the NESHAP Method for Demolition of Asbestos-Containing Buildings*, U.S. Environmental Protection Agency, National Risk Management Research Laboratory, Cincinnati, Ohio. Available at: <http://www.epa.gov/nrmrl/pubs/600r08094/600r08094.html>.
- HNF-2418, 1997, *Soil Contamination Standards for Protection of Personnel*, Fluor Daniel Hanford, Inc., Richland, Washington. Available at <http://www2.hanford.gov/arpir/?content=findpage&AKey=0904290338>.

National Historic Preservation Act of 1966, 16 USC 470, Section 106. Available at <http://www.achp.gov/docs/nhpa%202008-final.pdf>.

Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq. Available at: <http://www.epa.gov/rcraonline/>.

Toxic Substances Control Act of 1976, 15 U.S.C. 2605, et seq. Available at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=browse_usc&docid=Cite:+15USC2605.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington. Available at <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303>.

WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, as amended. Available at <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-400>.

WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative Code*. Available at: <http://www.ecy.wa.gov/biblio/wac173460.html>.

WAC 246-247, "Radiation Protection – Air Emissions", *Washington Administrative Code*, as amended, Washington State Department of Ecology, Olympia, Washington. Available at: <http://apps.leg.wa.gov/WAC/default.aspx?cite=246-247>.

WCH-191, 2008, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, Rev. 1, Washington Closure Hanford, LLC, Richland, Washington.

Appendix A

Radiological Airborne Emissions Calculations

This appendix provides the calculations for estimating the maximum potential-to-emit (PTE) radionuclides to the air as a result of the removal activities for the industrial buildings/structures and associated excavation discussed in Section 1.3. The PTE is defined as the rate of release of radionuclides from an emission unit based on the actual or potential discharge of the effluent stream that would result if all abatement control equipment did not exist, but operations are otherwise normal. Because nearly all of these buildings/ structures and surrounding soil are expected to contain little or no contamination, a contingent estimate of potential airborne impacts from any one of the buildings/structures and its associated soil site is provided, based on several bounding assumptions described as follows.

1. All building/structure removal and associated cleanup activity will be completed within a single year.
2. Each building/structure location is considered a separate potential source of emissions.
3. The bounding level of contaminated surface area to be impacted is 50,000 square meters.
4. Each building/structure location and associated soil site may exhibit some or all of the estimated PTE.
5. All alpha emitting isotopes are represented by Am-241 and all beta-gamma isotopes are represented by Cs-137+progeny. These isotopes exhibit the most conservative dose response (mrem per year/curie) factors so far as impacts to the maximally exposed public individual, and therefore were used for purposes of bounding any emissions impacts.
6. Location of all removal activities was assumed to be the 300 Area of the Hanford Site. Dose response factors for the 300 Area are the highest of any Hanford Site operating area.
7. For assigning release fractions to portions of the building/structure radionuclide inventory, all actions involving use of high-efficiency particulate air (HEPA) filtered vacuums, HEPA-filtered decontamination tools (e.g., scabblers, scarifiers) and gas/torch cutting or welding are assigned a release fraction of 1 as directed by the WAC-246-247-030(21)(a). Other pre-demolition and demolition activities including use of controlled explosives are assumed to have a release fraction of 1E-03 (for particulates and liquids).
8. For assigning a release fraction to the associated excavations, it was assumed that the entire soil radionuclide inventory is subject to a release fraction of 1E-03 for particulates and liquids.
9. The surface area and soil were assumed to be contaminated at levels on average of 1,000 disintegrations per minute (dpm)/100 cm² alpha and 100,000 dpm/100 cm² beta-gamma.
10. The overall PTE is for both demolition and excavation at each industrial site. The PTE is calculated as shown in Table A-1.
11. An example of a tracking log as shown in Tables A-2 and A-3 will be used at each site to estimate the potential emission curies handled at each industrial building/structure and associated excavation.

Table A-1. PTE Calculations

Annual Surface Area Contamination, 300 Area Bounding										
Isotope	Field Survey (dpm) ^a				Contaminated Surface Area (m ²)	Ci ^b	WAC 246-247-030-(21)(a) Release Factor	PTE (Ci/yr) ^c	Dose Factor (mrem/Ci) ^d	Unabated Effective Dose (mrem/yr TEDE to the MEI) ^e
Cs-137+D	1.0E+05				5.0E+04	2.3E-01	1.0E-03	2.3E-04 ^f	5.5E+00	1.3E-03
							1.0E+00	2.3E-03 ^{f(a)}	5.5E+00	1.3E-02
Am-241	1.0E+03				5.0E+04	2.3E-03	1.0E-03	2.3E-06 ^f	3.0E+02	6.9E-04
							1.0E+00	2.3E-05 ^{f(a)}	3.0E+02	6.9E-03
Sub total										2.2E-02
Annual Soil Contamination, 300 Area Bounding										
Isotope	Field Survey (dpm) ^g	pCi/g	Soil Density (g/m ^{3j})	pCi/m ^{3k}	Contaminated Soil Excavated Volume (m ^{3l})	Excavated Ci ^m	WAC 246-247-030-(21)(a) Release Factor	PTE (Ci/yr released) ⁿ	Dose Factor (mrem/Ci) ^o	Unabated Effective Dose (mrem/yr TEDE to the MEI) ^p
Cs-137+D	1.0E+05	2.8E+04 ^h	1.6E+06	4.5E+10	4.2E+01	1.9E+00	1.0E-03	1.9E-03	5.5E+00	1.1E-02
Am-241	1.0E+03	2.4E+03 ⁱ	1.6E+06	3.8E+09	4.2E+01	1.6E-01	1.0E-03	1.6E-04	3.0E+02	4.8E-02
Sub total										5.9E-02
Total										8.1E-02

A-3

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Table A-1. PTE Calculations

- a. Field Survey disintegration counts are per minute/100 cm² field instrument probe area. Note: 100 cm² = 0.01 m².
 Note: These are not actual field instrument readings; these are field readings corrected by standard radiation protection protocol to dpm.
- b. $Ci = (\text{Field Survey dpm}/0.01 \text{ m}^2) \cdot (\text{m}^2 \text{ of Contaminated Surface Area}) / (2.22\text{E}+12 \text{ dpm}/Ci)$
 Note: 2.22E+12 dpm/Ci is derived from $\{Ci = [3.7\text{E}+10 \text{ disintegrations per second (dps)}] \cdot (60 \text{ sec}/\text{min})\}$.
 [Definition of Ci is found in <http://www.umich.edu/~radinfo/introduction/terms.htm>]
- c. $\text{PTE (Ci/yr Released)} = [\text{WAC 246-247-030(21)(a) Release Factor}] \cdot (Ci)$
- d. Dose Factor Source: DOE/RL-2006-29, *Calculating Potential-to-Emit Radiological Releases and Doses*, Table 4-11.
- e. Unabated Effective Dose (mrem/yr TEDE to the MEI) = $[\text{PTE (Ci/yr)}] \cdot [\text{Dose Factor (mrem/Ci)}]$
- f. Assume 99 percent of the Ci (alpha and beta-gamma) are released as particulates or liquids.
- f(a) Assume 1 percent of the Ci (alpha and beta-gamma) are released as a gas from torch cutting, etc. activities.
- g. Field Survey dpm counts are as measured with field instruments, as described in footnote a.
- h. From HNF-2418, *Soil Contamination Standards for Protection of Personnel*, Table 3. This table presents conversions of instrument readings (cpm) to pCi/g in soil. In this case, a Geiger-Mueller reading for Cs-137+D of 2.2E+04 counts per minute (cpm) is shown to be the equivalent of 6.2E+04 pCi/g. Using standard protocol to account for field survey instrument counting efficiency for beta-gamma, 1 cpm=10 dpm. 2.2E+04 cpm converts to 2.2E+05 dpm. As a result, pCi/g of Cs-137+D for 1.0E+05 dpm is calculated as follows: $(1.0\text{E}+05 \text{ dpm}/2.2\text{E}+05 \text{ dpm}) \cdot (6.2\text{E}+04 \text{ pCi/g}) = 2.8\text{E}+04 \text{ pCi/g}$.
- i. From HNF-2418, *Soil Contamination Standards for Protection of Personnel*, Table 3. This table presents conversions of instrument readings to pCi/g in soil. In this case, the portable alpha meter (PAM) reading of 1.3E+00 cpm is shown to be the equivalent of 1.85E+01 pCi/g. Using standard protocol, 1 cpm=6 dpm for a PAM. 1.3E+00 cpm therefore converts to 7.8E+00 dpm. As a result, pCi/g of Am-241 for 1.00E+03 dpm is calculated as follows:
 $(1.00\text{E}+03 \text{ dpm}/7.8\text{E}+00 \text{ dpm}) \cdot (1.85\text{E}+01 \text{ pCi/g}) = 2.4\text{E}+03 \text{ pCi/g}$.
- j. From HNF-2418, *Soil Contamination Standards for Protection of Personnel*, Section 2, page 2.
- k. $\text{pCi}/\text{m}^3 = (\text{pCi}/\text{g}) \cdot [\text{Soil Density (g}/\text{m}^3)]$
- l. Administrative control
- m. $\text{Excavated Ci} = (\text{pCi}/\text{m}^3) \cdot (1 \text{ Ci}/1\text{E}+12 \text{ pCi}) \cdot (\text{Contaminated Soil Excavation Volume m}^3)$
- n. $\text{PTE (Ci/yr released)} = (\text{Excavated Ci}) \cdot [\text{WAC 246-247-030(21)(a) "Release Factor"}]$
- o. From DOE/RL-2006-29, *Calculating Potential-to-Emit Radiological Releases and Doses*, Table 4-11.
- p. Unabated effective dose (mrem/yr TEDE to the MEI) = $[\text{PTE (Ci/yr Released)}] \cdot [\text{Dose Factor (mrem/Ci)}]$
- MEI = maximally exposed individual
 PTE = potential-to-emit
 TEDE = total effective dose equivalent

Appendix B
Facility Status Change Form

B.1 Introduction

The purpose of the form is to document agreement among the parties on the status of facility deactivation, decontamination, decommissioning, and demolition (D4) operations and the disposition of underlying soil in accordance with the applicable regulatory decision documents. The form provides the following information to document either completion or deferral of a removal action:

- Quantitative information about the facility demolition
- The rationale/documentation of completion
- Photographs of the demolition activity
- Document that the wastes have all been shipped to the appropriate disposal facility
- Provide for U.S. Department of Energy (DOE) concurrence of completion, and
- Provide for a standard distribution of the form, including the Administrative Record.

A copy of the form is provided in Table B-1.

B.2 Form Completion Instructions

B.2.1 Top Portion

The top portion of the form should be filled out to identify the facility and under which removal action the completion applies.

B.2.2 Section 1: Facility Status

Facility Status

The appropriate block will be marked to identify whether the facility removal action is complete or whether remaining actions are being deferred.

Description of Completed Activities and Current Conditions

This portion will identify the following:

- Whether the facility removal actions were performed in accordance with the applicable action memorandum
- Whether all hazardous material was removed from the facility prior to demolition
- When the demolition was completed and whether the foundation and any other sub-surface structures were removed
- Document final disposition of the demolition debris.

Description of Deferral (as applicable)

This portion will be completed when activities are deferred. This may occur if contamination is discovered that is from an unknown source, or is extensive or unusually complex. A justification for the deferral will be provided (e.g., underlying waste sites, active utilities).

B.2.3 Section 2: Underlying Soil Status

Underlying Soil Status

The appropriate block will be marked to identify the relationship between the facility and waste sites.

Description of Current/As-Left Condition

This portion of the form will identify the following:

- Whether the underlying soils were a documented waste site
- If soil contamination was found as a result of the removal action
- Whether adjacent documented waste sites were affected
- A description of the method that will be used to backfill the excavated area.

Identification of Documented Waste Site(s) or Nature of Potential Waste Site Discovery (as applicable):

This portion will describe any waste sites or potential waste sites that were encountered as a result of the removal action.

B.2.4 Section 3: List of Attachments

Supplemental information includes the following:

1. Facility information: Building history, characterization information including a summary of the collected sample data, and a description of the D4 activities that were performed
2. Underlying Soil: An assessment of the contaminants of concern that could be potentially released during facility demolition, and the final radiological survey
3. Evaluation of Related/Adjacent Waste Sites: This will include an assessment of the related/adjacent waste and how they were affected by the removal action
4. Project photographs.

Table B-1. Facility Status Change Form

Date Submitted:	Area:	
Originator:	Facility ID:	Control #:
Phone:	Action Memorandum:	
<p>This form documents agreement among the parties listed below on the status of facility decontamination, deactivation, decommissioning, and demolition operations or debris removal in accordance with the applicable regulatory decision documents.</p>		
<p><u>Section 1: Facility Status</u></p> <p><input type="checkbox"/> All D4 operations required by action memo complete.</p> <p><input type="checkbox"/> D4 operations required by action memo partially complete, remaining operations deferred.</p> <p>Description of Completed Activities and Current Conditions:</p> <p>Description of Deferral (as applicable):</p> 		
<p><u>Section 2: Underlying Soil Status</u></p> <p><input type="checkbox"/> No waste site(s) present. No additional actions anticipated.</p> <p><input type="checkbox"/> Documented waste site(s) present. Cleanup and closeout to be addressed under a separate CERCLA Response Action..</p> <p><input type="checkbox"/> Potential waste site discovered during D4 operations. Waste site identification number <to be> assigned. Cleanup and closeout to be addressed under a separate CERCLA Response Action.</p> <p>Description of Current/As-Left Conditions:</p> <p>Identification of Documented Waste Site(s) or Nature of Potential Waste Site Discovery (as applicable):</p> 		
<p><u>Section 3: List of Attachments</u></p> 		
<p>_____ DOE-RL</p>		<p>_____ Date</p>