U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NUREG/BR-0204, Rev. 3

Instructions for Completing the U.S. Nuclear Regulatory Commission's Uniform Low-Level Radioactive Waste Manifest

Draft Report for Comment

Office of Nuclear Material Safety and Safeguards

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Draft Report for Comment

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COMMENTS ON DRAFT REPORT

Any interested party may submit comments on this report for consideration by the NRC staff. Comments may be accompanied by additional relevant information or supporting data. Please specify the report number **NUREG/BR-0204, Rev. 3** in your comments, and send them by the end of the comment period specified in the *Federal Register* notice announcing the availability of this report.

Addresses: You may submit comments by any one of the following methods. Please include Docket ID **NRC-2018-0155** in the subject line of your comments. Comments submitted in writing or in electronic form will be posted on the NRC website and on the Federal rulemaking website http://www.regulations.gov.

Federal Rulemaking Website: Go to http://www.regulations.gov and search for documents filed under Docket ID **NRC-2018-0155**. Address questions about NRC dockets to Jennifer Borges at 301-287-9127 or by e-mail at Jennifer.Borges@nrc.gov.

Mail comments to: May Ma, Director, Program Management, Announcements and Editing Branch (PMAE), Office of Administration, Mail Stop: TWFN-7-A-60M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

For any questions about the material in this report, please contact: Lloyd Desotell, Project Manager, and 301-415-5969 or by e-mail at Lloyd.Desotell@nrc.gov.

Please be aware that any comments that you submit to the NRC will be considered a public record and entered into the Agencywide Documents Access and Management System (ADAMS). Do not provide information you would not want to be publicly available.

The U.S. Nuclear Regulatory Commission has made the following changes between Revision 2 and Revision 3 of this document:

- updated instructions to reflect changes to the Uniform Manifest forms
- updated references to U.S. Department of Transportation (DOT) regulations to reflect the current DOT regulations
- additional discussion on the reporting of inventories based on lower limit of detection values, the potential use of indirect methods to determine these inventories, and the use of indirect methods in waste classification calculations
- clarification of the intent of the certification statement on Form 540
- overall improvements to the clarity of the document

Paperwork Reduction Act

This NUREG contains information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et. seq.). These information collections were approved by the Office of Management and Budget (OMB), under control numbers 3150-0164, 3150 -0165, and 3150-0166. The estimated burden to complete the forms associated with this NUREG is 45 minutes for NRC Forms 540 and 540A, 3.3 hours for NRC Forms 541 and 541A, and 45 minutes for NRC Forms 542 and 542A. Send comments regarding this information collection to the Information Services Branch, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0164, 3150-0165, and 3150-0166) Office of Management and Budget, Washington, DC 20503.

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INSTRUCTIONS FOR COMPLETING NRC'S LOW-LEVEL RADIOACTIVE WASTE MANIFEST

The U.S. Nuclear Regulatory Commission's (NRC's) Uniform Low-Level Radioactive Waste Manifest consists of the following three forms:

(1) NRC Forms 540 and 540A:[1] Uniform Low-Level Radioactive Waste Manifest (Shipping Paper) and continuation page

(2) NRC Forms 541 and 541A: Uniform Low-Level Radioactive Waste Manifest (Container and Waste Description) and continuation page

(3) NRC Forms 542 and 542A: Uniform Low-Level Radioactive Waste Manifest (Manifest Index and Regional Compact Tabulation) and continuation page

The NRC defines the entities that must comply with manifesting regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20, "Standards for Protection against Radiation," Appendix G, "Requirements for Transfers of Low-Level Radioactive Waste Intended for Disposal at Licensed Land Disposal Facilities and Manifests," Section I. Shipments of low-level radioactive waste to a licensed low-level radioactive waste land disposal facility for disposal are subject to NRC manifesting requirements. Shipments of low-level radioactive waste (as determined by the consignor within the definitions in the regulation) to waste processors or waste collectors, before disposal of the radioactive waste at a licensed land disposal facility, are also subject to these manifesting requirements, except as defined in the regulations. In accordance with 10 CFR Part 20, Appendix G, Section I—

> Licensees are not required by NRC to comply with the manifesting requirements of this part when they ship: (a) [low-level radioactive waste] LLW for processing and expect its return (i.e., for storage under their license) prior to disposal at a licensed land disposal facility; (b) LLW that is being returned to the licensee who is the "waste generator" or "generator," as defined in [10 CFR Part 20]; or (c) Radioactively contaminated material to a "waste processor" that becomes the processor's "residual waste."

NOTE: State or Compact manifesting requirements may encompass shipments beyond those defined by the NRC.

Shippers of low-level radioactive waste intended for disposal at a licensed land disposal facility must complete NRC Forms 540 and 541 as described above. Upon agreement between the shipper and consignee, the information required by NRC Form 541 may be transmitted electronically (10 CFR Part 20, Appendix G, Section III).

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[1] Forms 540 and 540A and their respective instructions are based on U.S. Department of Transportation (DOT) regulations, including changes published in the *Federal Register* on July 11, 2014 (79 FR 40590) with a required compliance date of July 13, 2015.

Processors and collectors of low-level radioactive waste that are shipping low-level radioactive waste attributed to others for disposal at a licensed land disposal facility must complete NRC Form 542. Upon agreement between the appropriate parties, the information required by NRC Form 542 may be transmitted electronically (10 CFR Part 20, Appendix G, Section III).

NRC Forms 540A, 541A, and 542A should be used if additional pages are needed for Forms 540, 541, and 542, respectively. In this document, the NRC staff uses the terms Forms 540, 541, and 542 to include both the form and the "A" supplement to the form, if applicable.

NOTE: Metric units should be used to report information on the Uniform Manifest forms. Use of metric units on NRC Form 540 is consistent with DOT regulations. DOT allows reporting of English units following the International System of Units (SI). NRC Forms 541 and 542 are also designed for metric reporting. However, if the consignor, consignee, and others having authority over reporting requirements agree, metric and English units may be used. In this case, the shipper may need to add the English units to the forms in a way that prevents misinterpretation.

Radioactive shipments that are not manifested under NRC regulations must continue to comply with DOT regulations.

The exhibits at the end of these instructions show sample NRC Forms 540, 541, and 542. Electronic copies of the forms can be downloaded from http://www.nrc.gov/reading-rm/doc-collections/forms/.

Questions about DOT shipping requirements can be directed to the DOT Hazardous Materials Information Center at 1-800-467-4922.

NRC FORM 540:
UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
(Shipping Paper)

NRC Form 540 must be completed for shipments of low-level radioactive waste intended for disposal at a licensed land disposal facility. The majority of the information on NRC Form 540 is needed to meet DOT shipping paper requirements for radioactive material shipments. The following are general instructions. Details on DOT requirements can be found in 49 CFR Parts 171, 172, and 173.

1. **Emergency Telephone Number**—The shipper must provide an emergency response telephone number or numbers for use in the event of an emergency (49 CFR 172.604). If a single number applies to every entry on the shipping papers, enter this number in the space provided. If there are multiple numbers, enter each individual number in Item 11 immediately after the applicable description of the radioactive material. Also enter the name of the person, contract number, or other unique identifier as required by 49 CFR 172.604. Enter the name of the organization responsible for providing the emergency response information. When multiple numbers are applicable, enter "See Item 11" into Item 1.

   Note that additional emergency response information must be available and presented in accordance with 49 CFR 172.602 and 49 CFR 172.604.

2. **Is This an "Exclusive Use" Shipment?**—The shipper answers by checking "Yes" or "No." See 49 CFR 172.203(d)(9). If "Yes," then the shipper must provide the carrier with specific instructions for maintaining exclusive-use shipment controls and must include the instructions with the shipping paper as required by the definition of "exclusive use" in 49 CFR 173.403.

3. **Total Number of Packages Identified on This Manifest**—Indicate the total number of packages listed on this manifest.

4. **Does EPA Regulated Waste Requiring a Manifest Accompany This Shipment?**—If the answer to this question is "Yes," the shipper completes the applicable U.S. Environmental Protection Agency (EPA) manifest and attaches it to NRC Form 540. The shipper should also identify the EPA manifest number in the space provided (if acceptable to the consignee, the manifest number appearing in Item 8 of NRC Form 540 may be identical to the EPA manifest number).

5. **Shipper**—Indicate the company or facility name, facility address, contact person, and telephone number. If applicable, indicate the permit or other similar number assigned to the shipper by the appropriate host State in which the designated licensed land disposal facility is located. Indicate whether the shipper is a waste generator, collector, or processor, as defined in 10 CFR Part 20, Appendix G, Section I, by checking the

appropriate box. If you are a generator, enter one of the following letter codes in the "GENERATOR TYPE" space: Government—G, Fuel Cycle Industry—FC, Nuclear Power—NP, University (Academic) —A, Medical—M, Industrial—I, Other—0. The form provides space for a shipper identification number for the shipper to record the number, if any, assigned to the shipper by the consignee or the designated land disposal facility operator. A space provided under the heading "SHIPMENT NUMBER" is for any use the shipper deems appropriate.

6. **Carrier**—Indicate either the carrier's name, address, contact person, and telephone number, or the carrier's name and EPA identification number. Also include the shipping date. Upon receipt of the shipment, an authorized carrier representative should acknowledge shipment receipt by signing and dating in the space provided.

7. Enter the total number of pages for **EACH** set of NRC forms (i.e., Forms 540 and 540A, Forms 541 and 541A, and Forms 542 and 542A). In addition, identify the number of pages of additional information that requires a separate page or pages and is a part of this manifest. If an EPA manifest accompanies the NRC forms, do not include its pages in Item 7.

If NRC Form 542 or additional pages are not part of this manifest, enter "None" in the appropriate blank.

If only NRC Form 540 (and 540A, if necessary) is intended to physically accompany the shipment (e.g., the shipper is electronically or otherwise providing NRC Forms 541 and 542 and any additional information separately to the consignee), indicate this by checking the box under "Electronic" for NRC Forms 541, 542, and additional information, as appropriate.

8. **Manifest Number**—The shipper should enter a manifest number of at least four numbers or letters, or both. The consignee of the low-level radioactive waste (e.g., the waste processor, waste collector, or licensed disposal site operator) may dictate the manifest number before shipment.

9. **Consignee**—Indicate the company or facility name, address, contact person, and telephone number. Upon receipt of the shipment, an authorized person at the facility must acknowledge receipt of the shipment by signing and dating in the space provided (10 CFR Part 20, Appendix G, Section III).

10. **Certification**—The person responsible for the packaging and labeling operations must sign and date the certification on the manifest. The person must also be authorized to sign on behalf of the shipping company or facility (49 CFR 172.204 and 10 CFR 20.2006(c) and 10 CFR Part 20, Appendix G, Section II). The certification statement on NRC Form 540 consists of a statement based on the DOT's certification statement requirement in 49 CFR 172.204 and statements based on the NRC's

certification statement requirement in 10 CFR Part 20, Appendix G, Section II, which refers to both DOT and Commission regulations.

11. **U.S. Department of Transportation Description (Including UN ID Number, Proper Shipping Name, Hazard Class, and Any Additional Information)**— DOT regulations at 49 CFR 172.202 contain the requirement for providing this information. For purposes of transportation in commerce, DOT regulations at 49 CFR 172.101 list hazardous materials. If this information is required, the shipper must use the exact descriptors, in the order specified, in the DOT regulations.

If the package contains fissile Class 7 (radioactive) material, include the words "fissile excepted" or the criticality safety index for the package, as appropriate (see 49 CFR 172.203(d)(6)). For packages approved by the U.S. Department of Energy (DOE) or the NRC, include a notation of the package identification marking as prescribed in the applicable DOE or NRC approval (49 CFR 172.203(d)(7)).

For highway route controlled quantities, as defined in 49 CFR 173.403, include the words "Highway route controlled quantity" or "HRCQ."

Additional description requirements (e.g., indication of Reportable Quantity and NRC Certificate of Compliance, if applicable) are specified at 49 CFR 172.203.

12. **DOT Labels**—See DOT regulations at 49 CFR 172.203(d)(4) and 49 CFR 172.403. Indicate the type of radioactive label that appears on the package (WHITE-I, YELLOW-II, YELLOW-III, and FISSILE [if applicable]). The shipper does not need to repeat the word "RADIOACTIVE" for the WHITE-I, YELLOW-II, and YELLOW-III labels.

If DOT does not require a label, place "NA" in this column.

13. **Transport Index**—See DOT regulations at 49 CFR 173.403 and 49 CFR 172.203(d)(5). The Transport Index is required for shipments containing packages bearing Radioactive Yellow-II or Yellow-III labels. This is a dimensionless number, which is equivalent to the radiation dose rate in millirem per hour at 1 meter from the surface of the package. The Transport Index is placed on the label of a package to designate the degree of control necessary during transportation. If reporting of the Transport Index is not required, place "NA" in this column.

14. **Physical and Chemical Form**—See DOT regulations at 49 CFR 172.203(d)(2). Describe the physical form of the contents of the package as "Solid," "Liquid," or "Gas." List the most prevalent chemical form (e.g., cellulose, cement, metallic oxides). Include additional generic information on material description, as needed, to satisfy requirements of shipment consignee (e.g., to meet the land disposal facility waste acceptance criteria (WAC)). Further information on the physical and chemical description of the waste is required on NRC Form 541. For special form materials, list the words "special form,"

unless they already appear in the proper shipping name in accordance with 49 CFR 172.203(d)(2).

15. **Individual Radionuclides**—See DOT regulations at 49 CFR 172.203(d)(1) and example abbreviations at 49 CFR 173.435. List the radionuclides (as determined by 49 CFR 173.433(g) and as required by the land disposal facility WAC, as applicable) that are present in the transport package.[2] The radionuclide's mass number may immediately follow the element symbol (i.e., a dash between the symbol and mass number is not needed). A semicolon and space should separate the listing of multiple radionuclides.

16. **Maximum Package Activity in SI Units**—Report the maximum activity in the transport package in SI units (e.g., megabecquerels). If desired, also report this activity in units of millicuries, in parentheses below the listing in SI units, in accordance with 49 CFR 172.203(d)(3).

17. **Total Weight or Volume**—Using the most appropriate units, identify the total weight or total volume of the material identified in Item 11.

18. **Identification Number of Package**—For each package, a package identification number, unique among the individual package identification numbers within the shipment, should be provided. You may use both numbers and letters.

The area labeled "for consignee use only" has been left blank intentionally to allow each consignee to record details such as discrepancies and burial information. The individual consignee should determine the information appropriate for in this space.

Use NRC Form 540A if additional space is needed to describe this shipment. Indicate the page number, total number of pages for Forms 540 and 540A, and the manifest number reported in Item 8.

[2] The radionuclides that should be reported in Form 540 are based on risk during transport or during handling of the waste, while the radionuclides that should be reported on Form 541 are based on the long-term dose at the disposal facility.

NRC FORM 541:
UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
(Container and Waste Description)

Page 2 of these instructions defines when shippers of low-level radioactive waste must complete NRC Form 541. This information may be transmitted electronically, as noted on pages 2 and 3 of these instructions.

For shipments of containerized waste to a consignee other than the land disposal facility operator, NRC regulations do not require the information requested under Items 5 through 11 of "DISPOSAL CONTAINER DESCRIPTION" and Item 17, "Waste Classification." (Note, however, that the consignee may require container information.)

For all shipments of uncontainerized waste, Items 5, 6, 11, and 13 are not applicable; report the volume of the waste in Item 7, the weight of the waste in Items 8 and 9, and surface radiation levels in Item 10. For uncontainerized wastes shipped to a consignee other than the land disposal facility operator, NRC regulations also do not require the information requested in Items 10 and 17.

1. **Manifest Totals**—Indicate the total number of low-level waste disposal containers described on this manifest (the total number of packages may be listed if the consignee is not the operator of a licensed low-level waste land disposal facility), the total net waste volume (cubic meters), and the total net weight[3] (kilograms).

Indicate the total individual manifested quantity of uranium-233 (U-233), uranium-235 (U-235), and plutonium (Pu) in special nuclear material (grams). Note that the quantity requested is the quantity of the U-233, U-235, and Pu in the special nuclear material, not the total mass of the material itself. Also, report the total sum of the masses of U-233, U-235, and Pu in special nuclear material in grams. Indicate the total number of disposal containers containing each type of special nuclear material in parenthesis after the quantity listing.

In 10 CFR Part 20, Appendix G (I)(B)(4), the NRC requires the reporting of the total radionuclide activity in the shipment. The reported total radionuclide activity should represent the best estimate of the total activity and should consider the activity based on lower limit of detection (LLD) values or indirect methods, as applicable. In 10 CFR Part 20, Appendix G (I)(B)(5), the NRC requires separate manifest totals for tritium (H-3), carbon-14 (C-14), technetium (Tc-99), iodine-129 (I-129), U-233, U-235, and Pu, as well as U and thorium (Th) in source material. For H-3, C-14, Tc-99, and I-129, enter the totals in megabecquerels (MBq) in the appropriate boxes. If the radionuclides are known to be absent based on process knowledge, place "NP" in the appropriate space. If the radionuclides are present in the waste in detectable quantities,

[3] Although kilogram is a unit of mass, not weight, the term "weight" is used in the instructions for NRC Form 541 to be consistent with 10 CFR Part 20, Appendix G.

report the total activity based on the measured activity. If the radionuclides could be present in the waste, and the measured activity is less than the LLD in any portion of the shipment, the shipper can use indirect methods to determine the activity to report or the shipper can report the activity for that portion of the shipment based on the LLD value and the amount of waste.[4] Indirect methods can be used to determine the activity of the radionuclides present at less than the LLD values if there is reasonable assurance that the indirect method can be correlated with actual measurements. Regulatory Issue Summary 2015-02, "Reporting of H-3, C-14, Tc-99, and I-129 on the Uniform Waste Manifest," dated February 18, 2015, provides more information on the use of indirect methods to report the activity of H-3, C-14, Tc-99, and I-129.

The activities for the shipment reported in Item 1 should include the sum of the activity developed based on measurements, LLD values, and indirect methods, as applicable. If any portion of the reported activity was determined based on LLD values or indirect methods, mark the reported activity with an asterisk and provide additional details on the method used to determine the activity under Item 16 as described below. Providing the basis for the reported activity of these four radionuclides is important because they are often risk-significant at land disposal facilities. This information allows the land disposal facilities to better understand and evaluate the uncertainty associated with the reported activity.

Report the total amount of U and Th in source material (kilograms), including U and Th in unimportant quantities, as defined in 10 CFR 40.13.

2. Manifest Number—Transfer the manifest number from NRC Form 540, Item 8.

3. Page __of__Page(s)—Include the total number of pages for Forms 541 and 541A.

4. Shipper Name and ID Number—Same as reported in Item 5 of NRC Form 540.

NOTE: See previous discussion on which of Items 5 through 11 on Form 541 should be completed for uncontainerized waste.

5. Container Identification Number/Generator ID Number(s)—Provide a disposal container identification number unique among the individual container identification numbers within the shipment (10 CFR Part 20, Appendix G (I)(C)(1)). Both numbers and letters may be used. Also, indicate ID number(s) of the generator(s) contributing waste to the disposal container. If more than one disposal container is assigned to a single generator, there is no need to repeat the generator ID number. Note that the definition of "generator" identified in this item includes (a) "waste generators" as defined in

[4] It is generally not acceptable to assume a value of zero for the inventory of a radionuclide that has a concentration less than its LLD value in the performance assessment for the disposal site unless there is adequate justification that the radionuclide is not present in the waste. The activity derived based on the LLD or on an indirect method should be used in the performance assessment.

10 CFR Part 20, Appendix G, and (b) those licensees to which waste can be reasonably attributed, in the context of the Low-Level Radioactive Waste Policy Amendments Act of 1985, as a result of processing, decontamination, or transfers of radioactive materials.

For disposal containers with mixtures of waste from different generators, list each generator on a separate row (10 CFR Part 20, Appendix G (I)(E)). Additionally, use separate rows for each discrete waste type, as defined in 10 CFR Part 20, Appendix G (I)(E) (i.e., activated material, contaminated equipment, mechanical filters, sealed source/devices, and wastes in solidification/stabilization media), within the same container. Discrete items as defined in the 2015 Concentration Averaging and Encapsulation Branch Technical Position (i.e., activated metals, sealed sources, cartridge filters,[5] contaminated materials, and components incorporating radioactivity into their design) should also be listed on separate rows. Individual consignees (e.g., land disposal facility operators) may require more extensive breakdowns of radiological descriptions.

6. **Container Description**—Using the codes found in Note 1 at the bottom of NRC Form 541, describe the disposal container (10 CFR Part 20, Appendix G (I)(C)(2)). When Code 13 (High-Integrity Container) is used, also identify the manufacturer and the model number. NRC or host State Certificate of Compliance Number(s) should be identified, as appropriate. If Code 19, "Other," is used, describe the container in Item 6. If the explanation is not entered in Item 6 (the preferred method), enter "See additional page" and provide the description on that page. The additional page should be included in the "additional information" total pages called for in Item 7 of NRC Form 540. If the container and waste require disposal in an approved structural overpack, the letters "-OP" should be entered after the appropriate code number.

7. **Volume (Cubic Meters)**—In 10 CFR Part 20, Appendix G (I)(C)(3), the NRC requires the reporting of the volume displaced by the disposal container. At a minimum, the volume of the outside dimensions of each container should be reported to at least the nearest hundredth of a cubic meter. Consignees (e.g., land disposal facility operators) may require a greater sensitivity of measurement. For volumes of less than 1 cubic meter, always include a zero in front of the decimal. For bulk unpackaged waste or unpackaged components or equipment, enter the estimated volume of the waste (10 CFR Part 20, Appendix G (I)(D)(1)).

8. **Waste and Container Weight (Kilograms)**—List the combined weight, in kilograms, of the container plus the contents (10 CFR Part 20, Appendix G (I)(C)(4)). The weight listed should include all fill materials in the container. For uncontainerized waste, provide the weight of the waste (10 CFR Part 20, Appendix G (I)(D)(1)). Consignees may require specific sensitivities of measurement.

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[5] In some cases, the cartridge filters may be treated as blendable waste for the purpose of concentration averaging (see Section 3.3.3, "Alternative Treatment of Certain Cartridge Filters," in the 2015 Concentration Averaging and Encapsulation Branch Technical Position).

9. Waste Weight (Kilograms)—List the weight, in kilograms, of the waste. Include the weight of fill material when the reported concentrations in the waste are based on averaging over the fill material in accordance with applicable guidance (e.g., the 2015 Concentration Averaging and Encapsulation Branch Technical Position and applicable State guidance).

10. Surface Radiation Level (µSv/hr or mSv/hr)—Indicate the maximum radiation level at the surface of the disposal container or uncontainerized waste (10 CFR Part 20, Appendix G (I)(C)(5) and (I)(D)(6)). If this level may not represent the highest radiation level on the disposal container because of operational limitations or other factors, provide additional descriptive information to help the disposal facility or processing staff appropriately manage the waste. "BKG" should not be used for background levels unless the background level is indicated in this column.

11. Surface Contamination (MBq/100 cm^2): Alpha, Beta-Gamma—Record the results of contamination surveys performed on the disposal container. “BKG” should not be used for background levels unless the background level is indicated in this column. Estimated values are acceptable if potential occupational exposures limit survey data collection.

12. Waste Descriptor—In 10 CFR Part 20, Appendix G (I)(C)(6) and (I)(D)(2), the NRC requires the reporting of a physical and chemical description of the waste. Using the codes found in Note 2 at the bottom of NRC Form 541, indicate the codes that most specifically describe the type of waste in the container. As described in Item 5 above, for discrete waste types within the same container, the waste descriptor for the different waste types should be written on a separate row to allow for the provision of radiological descriptions on an individual waste descriptor and individual solidification or stabilization media basis. Individual consignees (e.g., land disposal facility operators) may require more extensive breakdowns of radiological descriptions. If Code 59, “Other,” is used, a written explanation should be provided. The preferred option is to include the explanation in Item 12, but if additional space is required, enter “See additional page” in Item 12. The additional page should be included in the “additional information” total pages called for in Item 7 of NRC Form 540.

13. Approximate Waste Volume(s) in Container—Indicate the approximate volume in cubic meters of containerized waste by generator and discrete waste type, as applicable (10 CFR Part 20, Appendix G (I)(C)(8)). “>85%” may be entered if: (1) the disposal container “fill volume” exceeds 85 percent, (2) the disposal container does not contain discrete wastes (as defined in Item 5 above), together or mixed with other waste types, and does not contain more than one solidification/stabilization media, and (3) the external volume reported in Item 7 is approximately equal to the internal disposal container volume. The waste volume reported should be consistent with the volume that is averaged over for the purpose of determining the concentration in the waste.

14. Sorbent, Solidification, Stabilization Media—In 10 CFR Part 20, Appendix G (I)(C)(9), the NRC requires the reporting of the sorbing and solidification media, if any, for containerized waste. For uncontainerized waste, any sorbing or solidification media should also be reported here. All shipments should use the codes found in Note 3 at the bottom of NRC Form 541 to identify the material used to solidify or absorb waste material. The spacing between the vertical listings of media descriptors (if more than one media descriptor is included in a single disposal container) allows for the provision of radiological descriptions on an individual "media-descriptor" basis. Individual consignees may require more extensive breakdowns of radiological descriptions. Similarly, individual land disposal facilities may require solidification of certain wastes (e.g., oil) in specified media and may require identification of media vendor (manufacturer) and brand name. If Codes 89 or 99, "Other," is used, a written explanation should be provided. The preferred option is to include the explanation in Item 14, but if additional space is required, enter "See additional page" in Item 14. The additional page should be included in the "additional information" total pages called for in Item 7 of NRC Form 540.

If the solidification process is intended to stabilize the waste in accordance with applicable NRC regulations at 10 CFR 61.56(b), the letter "-S" should be entered after the appropriate code number. Additionally, "-S" should also be entered if the solidification process is required to meet land disposal facility requirements. For all wastes reported to meet the aforementioned stability requirements through solidification, identify the vendor (manufacturer) and the brand name of the solidification media in this column.

15. Chemical Description—In 10 CFR Part 20, Appendix G (I)(C)(6) and (I)(D)(2), the NRC requires the reporting of a chemical description of the waste. In this description, the most prevalent chemical forms of the waste should be listed. Information in Item 15 should expand upon the chemical form description in Item 14 of NRC Form 540. If animal carcasses were coded in Item 12, the chemical form should include the word "LIME," if applicable, in addition to any other significant chemicals. Also, indicate the name of the chelating agents that are present in amounts greater than 0.1 percent by weight of waste. Specify the percent in the column under the heading "Weight % Chelating Agent if >0.1%." If chelating agents are not present, indicate "NP." If chelating agents represent less than 0.1 percent by weight, indicate "<0.1%." If wastes were generated from large chemical decontamination processes, indicate the process in this column. If an additional sheet describing the content of these wastes is needed, include this sheet in the pages reported in Item 7 of NRC Form 540.

16. Radiological Description—In 10 CFR Part 20, Appendix G (I)(C)(10) and (I)(D)(5), the NRC requires the reporting of the identities and activities of individual radionuclides in each container (for containerized waste) or in the waste (for uncontainerized waste). This information may be presented in either of two ways: (1) by listing the activity of all significant radionuclides present in the waste or (2) by reporting the total activity and

entering the percent by activity of each radionuclide. DOT regulations at 49 CFR 172.203(d)(3) authorize the use of abbreviations for the radionuclides. (See also example abbreviations at 49 CFR 173.435.)

A radionuclide is "significant" if it is contained in the waste in concentrations[6] greater than 0.01 times the concentration of that radionuclide listed in Table 1 of 10 CFR 61.55 or 0.01 times the smallest concentration of that radionuclide listed in Table 2 of 10 CFR 61.55. For waste being shipped to a land disposal facility, radionuclides that are present at more than 0.01 times the WAC, if applicable, at the land disposal facility are significant and should also be reported. The lower of the value developed from the tables in 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," or the WAC, if applicable, should be used in determining whether a radionuclide is "significant." A radionuclide other than one listed in the 10 CFR 61.55 tables or the land disposal facility WAC, if applicable, is considered significant if it is contained in the waste in concentrations greater than 0.26 megabecquerels (MBq) per cubic centimeter (cm^3). Furthermore, any radionuclide whose activity represents a reportable quantity under DOT regulations (see 49 CFR 172.101, Appendix A) or is 0.01 or more of the total activity within the disposal container should be listed, even if the above concentration criteria are not exceeded. Listing only the most abundant radionuclides or using the category "mixed fission products" is not acceptable.

The NRC recognizes that in some cases the threshold for a radionuclide being "significant" based on the above criteria may be below a practical detection level.[7] In accordance with 10 CFR 61.55(a)(8), the reported activity of a radionuclide can be derived from the LLD value or through the use of indirect methods (e.g., scaling factors). The use of indirect methods is acceptable as long as there is reasonable assurance that the indirect methods can be correlated with actual measurements.

When using the first approach (i.e., listing the activity of all significant radionuclides present in the waste), all significant radionuclides present in the waste should be listed and followed by their respective activities in megabecquerels for each container. If waste from more than one generator is contained in a single container, the activity for each significant radionuclide for each generator should be reported for the container. Progeny should be either individually reported or, if within a factor of 2 of being in equilibrium with its (their) parent, can be reported as the parent with its activity listed, but with the symbol "D" or "NAT" indicating progeny in equilibrium (e.g., cesium-137D or ThNAT). For waste included within a single container, report the significant

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6 The average concentration in the container (for containerized waste) or in the waste (for uncontainerized waste) should be used to determine whether the radionuclide is "significant." The NRC provided guidance on the determination of the average concentration in the 2015 Concentration Averaging and Encapsulation Branch Technical Position.

7 The 1983 Branch Technical Position on Waste Classification and Waste Form states that the LLD should be no more than 0.01 times the concentration for that radionuclide listed in Table 1 of 10 CFR 61.55 or 0.01 times the smallest concentration of that radionuclide listed in Table 2 of 10 CFR 61.55. Land disposal facilities may have additional requirements for the LLD values.

radionuclides and their respective activities separately for discrete waste types (i.e., activated materials, contaminated equipment, mechanical filters, and sealed source/devices and wastes in solidification/stabilization media). Other wastes may be described by a combination of waste descriptor codes and, as a result, the radionuclides and activities may be reported as a combined total.

If the reported activity is developed based on an LLD value or the use of indirect methods, the activity should be marked with parentheses for LLD-based values and with a pound (#) sign for values based on indirect methods. If more than one method is used to develop the activity (e.g., a portion of the activity for a radionuclide is developed based on actual measurements and a portion is developed based on an indirect method or LLD value), write the activity for the radionuclide developed using each method separated by a slash and mark the activity as described above as appropriate. (See Table 1 for examples for reporting the activity.)

Table 1 Examples for Reporting a 10,000 MBq Activity on the Uniform Waste Manifest

Method Used to Develop Radionuclide Specific Activity for Shipment	How to Mark Activity
Reported activity is based on actual measurements	10,000
Reported activity is developed based on LLD values	(10,000)
Reported activity is developed based on the use of indirect methods	10,000#
Reported activity for shipment is calculated based on a combination of both indirect methods and LLD values*	5,000# / (5,000)
Reported inventory is developed based on a combination of actual measurements, indirect methods , and LLD values **	5,000 / 2,500# / (2,500)

* In this example, half of the reported activity is based on LLD values and half is based on indirect methods.
** In this example, half of the reported inventory is based on actual measurements, a quarter of the inventory is based on LLD values, and a quarter is based on indirect methods.

For containerized waste, after listing the individual radionuclides as described above, enter the word “Total” on a new line and enter the total activity contained in the container. In 10 CFR Part 20, Appendix G (I)(C)(11), the NRC requires the reporting of the total activity in the container, so this activity should represent the best estimate of the total activity and should include the activity derived based on the LLD or indirect methods, as applicable.

To use the second approach (i.e., reporting the total activity in each container and entering the percent by activity of each radionuclide), for containers containing a single waste type, enter the total MBq in the container (for each waste generator, if waste from more than one generator is included in a single container) and enter the percent of each significant radionuclide by activity. Always include the “%” sign when using this option. If any of the activity is based on the use of an LLD value or an indirect method, mark the percentages as described above.

Individual consignees (e.g., land disposal facility operators) may require more extensive breakdowns of radiological descriptions or may not allow the second method of reporting described above.

NOTE: The activity for U and Th in source material and U-233, U-235, and Pu in special nuclear material should be reported in MBq in Item 16. The quantity of these radionuclides should also be reported, in kilograms for source material—including the abbreviation "kg,"—and in grams for special nuclear material—including the abbreviation "g." The mass quantities should be reported in brackets, either adjacent to the activity listing or below the radionuclide listing.

17. Waste Classification—Using the following codes, indicate the waste class and the structural stability of the waste in accordance with applicable NRC requirements or the radioactive material license applicable at the disposal facility to which the waste will be consigned. Radionuclides listed in 10 CFR 61.55 that were identified as "significant"[8] in Item 16 should be considered in the determination of the waste class. Waste generators shipping to processors need not complete this item.

AS	Class A Stable
AU	Class A Unstable
B	Class B
C	Class C

Use BU or CU (unstable Class B or C) to classify waste requiring appropriate handling or processing at a disposal facility to achieve required stability.

If greater-than-Class-C wastes are shipped, use "GTCC."

Use NRC Form 541A if additional space is needed to describe this shipment. Indicate the page number, total number of pages for Forms 541 and 541A, and the manifest number from NRC Form 540, Item 8.

[8] For radionuclides that were identified as "significant" but were present at concentrations less than the LLD value, the activity assumed in the determination of the waste class should be based on the LLD value or an indirect method, unless there is adequate justification (e.g., based on process knowledge) that the radionuclide is not present in the waste. It is generally not appropriate to assume a value of zero for the activity of a radionuclide that could be present in the waste when determining the waste class.

NRC FORM 542:
UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
(Manifest Index and Regional Compact Tabulation)

Processors and collectors of low-level radioactive waste that are shipping low-level radioactive waste attributed to others for disposal at a licensed land disposal facility must complete NRC Form 542.

1. **Waste Collector/Processor**—Complete the collector's or processor's name, ID number, and the shipping date. The form also includes space for any use deemed appropriate by the shipper.

As defined in 10 CFR Part 20, Appendix G, a waste collector or processor is an entity, operating under a Commission or Agreement State license, whose principal purpose for possessing the radioactive material or waste is as follows:

- A collector collects and consolidates waste generated by others and transfers this waste, without processing or repackaging, to another waste collector, processor, or licensed land disposal facility.

- A processor processes, repackages, or otherwise treats low-level radioactive material or waste generated by others before the eventual transfer of the waste, or waste residue, to a licensed land disposal facility.

2. **Manifest Number**—Transfer the manifest number from NRC Form 540, Item 8.

3. **Page _ of ___Page(s)**—Include the total number of pages for Forms 542 and 542A.

4. **Generator Identification Number**—Each row should include one of the generator ID numbers from NRC Form 541, Item 5. This column should include all generator numbers associated with generators to whom low-level radioactive waste is being attributed. List one, and only one, generator, and accompanying information, in each block. Provide the generator information requested in Items 5 through 11 in the same row.

5. **Generator Name, Permit Number (if Applicable), and Telephone Number**—Specify the generator name, permit number (if applicable), and telephone number for the generator to whom waste is being attributed. If the permit number is reported in Item 4, it need not be repeated here.

6. **Generator Facility Address**—List the complete address of the generator's facility that has contributed low-level waste to the shipment. List one, and only one, generator address in the block consistent with the generator information provided in Item 5.

7. **Preprocessed Waste (or Material) Volume**—Indicate the approximate volume in cubic meters (not including the container) of the preprocessed waste or material. This is the volume of waste or material received from the consignor's facility. This information may be that indicated on the consignor's NRC Form 541, Item 13, or the shipping paper used to facilitate the transfer of radioactive material.

8. **Manifest Number(s) Under Which Waste (or Material) Received and Date of Receipt**—List the previous manifest number(s) applicable to the low-level waste attributed to the generator listed in Item 5, and date(s) of waste or material receipt by the shipper identified in Item 5 of NRC Form 540.

9. **Waste Code: Processed or Collected**—Indicate the proper waste code, "P" or "C," using the definitions of waste processor and waste collector in 10 CFR Part 20, Appendix G. Do not mix processed and collected waste on the same line; list them separately.

10. **Originating Compact Region or State**—Identify the originating compact region or unaffiliated state for the original generator of the waste, as defined in 10 CFR Part 20, Appendix G, Section I. State abbreviations may be used. Compact abbreviations may be used when they cannot be confused with State abbreviations (i.e., do not use two-letter Compact abbreviations).

11. **As Processed/Collected Total**—For each original generator in Item 5, list the total source material (in kilograms), special nuclear material (in grams), activity (in megabecquerels) contained in the waste, and the volume (in cubic meters) attributed to that generator. The NRC defines special nuclear material and source material in 10 CFR 70.4 and 10 CFR 40.4, respectively.

Use NRC Form 542A if additional space is needed to describe this shipment. Indicate the page number, total number of pages for Forms 542 and 542A, and the manifest number from NRC Form 540, Item 8.

APPROVED BY OMB: NO. 3150-0164
EXPIRES: (MM/DD/YYYY)

Estimated burden per response to comply with this information collection request: 45 minutes. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0164), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 540 **U.S. NUCLEAR REGULATORY COMMISSION**

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST SHIPPING PAPER

See NUREG/BR-0204 for detailed instructions for completing this form:
http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0204/

1. Emergency Telephone Number *(Include area code)*	**5. Shipper - Name and Facility**	**Shipper ID Number** ☐ Collector ☐ Processor ☐ Generator Type (Specify)	**7. NRC Form 540 and 540A Page 1 of** ____ Page(s) Electronic ☐ **NRC Form 541 and 541A** ____ Page(s) ☐ **NRC Form 542 and 542A** ____ Page(s) ☐ **Additional Information** ____ Page(s) ☐
	User Permit Number / **Shipment Number**		**8. Manifest Number** / **Contact**
Organization	**Contact**	**Phone No (Include Area Code)**	**9. Consignee - Name and Facility Address** / **Phone No (Include Area Code)**
2. Is this an "Exclusive Use" Shipment? ☐ Yes ☐ No **3. Total Number of packages identified on this manifest?**	**6. Carrier - Name and Address**	**EPA I.D. Number** **Shipping Date**	**Signature - Authorized consignee acknowledging waste receipt** / **Date**
4. Does EPA regulated waste requiring a manifest accompany this shipment? (If "Yes," provide Manifest Number). ☐ Yes ☐ No **EPA Manifest Number**	**Contact**	**Phone No (Include Area Code)**	**10. CERTIFICATION** "This is to certify that the herein-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation, the Commission, and equivalent state regulations. For materials that are consigned to a land disposal facility or waste collector, this certifies that the materials are classified per the applicable requirements of 10 CFR Part 61, meet the land disposal facility's waste acceptance criteria (if applicable), and are in proper condition for disposal as described in accordance with the applicable requirements of 10 CFR Parts 20 and 61, or equivalent state regulations. A collector in signing the certification is certifying that nothing has been done to the collected waste which would invalidate the waste generator's certification."
	Signature - Authorized carrier acknowledging waste receipt / **Date**		**Authorized Signature and Title** / **Date**

11. U. S. Department of Transportation Description (Including UN ID number, proper shipping name, hazard class, and any additional information)	12. DOT Labels	13. Transport Index	14. Physical and Chemical Form	15. Individual Radionuclides	16. Maximum Package Activity in SI Units	17. Total Weight or Volume (Use appropriate units)	18. Identification Number of Package

For Consignee Use Only

NRC FORM 540 (MM-YYYY)

APPROVED BY OMB: NO. 3150-0164
EXPIRES: (MM/DD/YYYY)

Estimated burden per response to comply with this information collection request: 45 minutes. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0164), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 540A
(MM-YYYY)

U.S. NUCLEAR REGULATORY COMMISSION

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST SHIPPING PAPER (Continuation)

See NUREG/BR-0204 for detailed instructions for completing this form: http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0204/

8. Manifest Number
(Use this number on all continuation pages)

Page _____ Of _____ Page(s)

11. U. S. Department of Transportation Description (Including UN ID number, proper shipping name, hazard class, and any additional information)	12. DOT Labels	13. Transport Index	14. Physical and Chemical Form	15. Individual Radionuclides	16. Maximum Package Activity in SI Units	17. Total Weight or Volume (Use appropriate units)	18. Identification Number of Package

NRC FORM 540A (MM-YYYY)

APPROVED BY OMB: NO. 3150-0166
EXPIRES: (MM/DD/YYYY)

Estimated burden per response to comply with this information collection request: 3.3 hours. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0166), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 541 **U.S. NUCLEAR REGULATORY COMMISSION**

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

See NUREG/BR-0204 for detailed instructions for completing this form:
http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0204/

1. Manifest Totals

Number of Packages/ Disposal Containers	Net Waste Volume (m^3)	Net Waste Weight (kg)	Special Nuclear Material (grams) U-233	U-235	Pu	Total

Activity (MBq) All Nuclides	Tritium	C-14	Tc-99	I-129	Source (kg)

2. Manifest Number

3. Page 1 **of** _____ **Page(s)**

4. Shipper Name

Shipper I.D. Number

Disposal Container Description								Waste Description for Each Waste Type in Container							
5. Container Identification Number/Generator ID Number(s)	6. Container Description (See Note 1)	7. Volume (m^3)	8. Waste and Container Weight (kg)	9. Waste Weight (kg)	10. Surface Radiation Level ☐ (μSv/hr) ☐ (mSv/hr)	11. Surface Contamination MBq/100cm^2 Alpha	Beta-Gamma	Physical Description 12. Waste Descriptor (See Note 2)	13. Approximate Waste Volume(s) in Container	14. Sorbent Solidification, Stabilization, Media (See Note 3)	15. Chemical Description Chemical Form/ Chelating Agent	Weight % Chelating Agent if > 0.1%	16. Radiological Description Individual Radionuclides and Activity (MBq) and Container Total; or Container Total Activity and Radionuclide Percent	17. Waste Class AS-Class A Stable AU-Class A Unstable B-Class B C-Class C

NOTE 1: Container Description Codes. For containers/ waste requiring disposal in approved structural overpacks, the numerical code should be followed by "-OP."

1. Wooden Box or Crate
2. Metal Box
3. Plastic Drum or Pail
4. Metal Drum or Pail
5. Metal Tank or Liner
6. Concrete Tank or Liner
7. Polyethylene Tank or Liner
8. Fiberglass Tank or Liner
9. Demineralizer
10. Gas Cylinder
11. Bulk Unpackaged Waste
12. Unpackaged Components
13. High Integrity Container
19. Other. Describe in item 6, or additional page

NOTE 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

20. Charcoal
21. Incinerator Ash
22. Soil
23. Gas
24. Oil
25. Aqueous Liquid
26. Filter Media
27. Mechanical Filter
28. EPA or State Hazardous
29. Demolition Rubble
30. Cation Ion-exchange Media
31. Anion Ion-exchange Media
32. Mixed Bed Ion-exchange Media
33. Contaminated Equipment
34. Organic Liquid (except oil)
35. Glassware or Labware
36. Sealed Source/Device
37. Paint or Plating
38. Evaporator Bottoms/ Sludges/Concentrates
39. Compactible Trash
40. Noncompactible Trash
41. Animal Carcass
42. Biological Material (except animal carcass)
43. Activated Material
59. Other. Describe in item 12, or additional page

NOTE 3: For solidification media that meet disposal site structural stability requirements, the numerical code should be followed by "-S."
For all solidification media, the vendor (manufacturer) and brand name should also be identified in item 14. Code 100=NONE REQUIRED.

Sorption
60. Speed Dri
61. Celetom
62. Floor Dry/ Superfine
63. High Dri
64. Safe T Sorb
65. Safe N Dri
66. Florco
67. Florco X
68. Solid A Sorb
69. Chemsil 30
70. Chemsil 50
71. Chemsil 3030
72. Dicaperl HP200
73. Dicaperl HP500
74. Petroset
75. Petroset II
76. Aquaset
77. Aquaset II
89. Other. Describe in item 14, or additional page

Solidification
90. Cement
91. Concrete (encapsulation)
92. Bitumen
93. Vinyl Chloride
94. Vinyl Ester Styrene
99. Other. Describe in item 14, or additional page
100. None Required

APPROVED BY OMB: NO. 3150-0166
EXPIRES: (MM/DD/YYYY)

Estimated burden per response to comply with this information collection request: 3.3 hours. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0166), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 541A
(MM-YYYY)

U.S. NUCLEAR REGULATORY COMMISSION

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
CONTAINER AND WASTE DESCRIPTION (Continuation)

See NUREG/BR-0204 for detailed instructions for completing this form: http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0204/

2. Manifest Number
(Use this number on all continuation pages)

3. Page _____ Of _____ Page(s)

Disposal Container Description								Waste Description for Each Waste Type in Container						
								Physical Description			15. Chemical Description		16. Radiological Description	
5. Container Identification Number/Generator ID Number(s)	6. Container Description (See Note 1)	7. Volume (m^3)	8. Waste and Container Weight (kg)	9. Waste Weight (kg)	10. Surface Radiation Level ☐ (μSv/hr) ☐ (mSv/hr)	11. Surface Contamination MBq/100cm^2 Alpha	Beta-Gamma	12. Waste Descriptor (See Note 2)	13. Approximate Waste Volume(s) in Container	14. Sorbent Solidification, Stabilization, Media (See Note 3)	Chemical Form/ Chelating Agent	Weight % Chelating Agent if > 0.1%	Individual Radionuclides and Activity (MBq) and Container Total; or Container Total Activity and Radionuclide Percent	17. Waste Class AS-Class A Stable AU-Class A Unstable B-Class B C-Class C

APPROVED BY OMB: NO. 3150-0165
EXPIRES: (MM/DD/YYYY)

Estimated burden per response to comply with this information collection request: 45 minutes. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0166), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently vaild OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 542 **U.S. NUCLEAR REGULATORY COMMISSION**

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST MANIFEST INDEX AND REGIONAL COMPACT TABULATION

See NUREG/BR-0204 for detailed instructions for completing this form:
http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0204/

List all original "Processed Waste" generators (if any) before "Collected Waste" generators.

1. Waste Collector/Processor

Name

Identification Number

Shipping Date

Shipper Use Only

2. Manifest Number

3. Page 1 **of** _____ **Page(s)**

4. Generator Identification Number	5. Generator Name Permit Number (If Applicable) and Telephone Number	6. Generator Facility Address	7. Preprocessed Waste (or material) Volume (m^3)	8. Manifest Number(s) Under Which Waste (or material) Received and Date of Receipt	9. Waste Code P = Processed C = Collected	10. Originating Compact Region or State	11. As processed/collected total			
							A. Source Material (kg)	B. SNM (g)	C. Activity (MBq)	D. Volume (m^3)

NRC FORM 542 (MM-YYYY)

APPROVED BY OMB: NO. 3150-0165
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Estimated burden per response to comply with this information collection request: 45 minutes. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0166), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently vaild OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 542A **U.S. NUCLEAR REGULATORY COMMISSION**

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
MANIFEST INDEX AND REGIONAL COMPACT TABULATION (Continuation)

See NUREG/BR-0204 for detailed instructions for completing this form: http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0204/

2. Manifest Number

3. Page ___ of ___ Page(s)

4. Generator Identification Number	5. Generator Name Permit Number (If Applicable) and Telephone Number	6. Generator Facility Address	7. Preprocessed Waste (or material) Volume (m^3)	8. Manifest Number(s) Under Which Waste (or material) Received and Date of Receipt	9. Waste Code P = Processed C = Collected	10. Originating Compact Region or State	11. As processed/collected total			
							A. Source Material (kg)	B. SNM (g)	C. Activity (MBq)	D. Volume (m^3)

NRC FORM 542A (MM-YYYY)

NRC FORM 335
(12-2010)
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U.S. NUCLEAR REGULATORY COMMISSION

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(See instructions on the reverse)

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Draft Report for Comment

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11. ABSTRACT (200 words or less)
NUREG/BR-0204 contains guidance for completing the Uniform Low-Level Radioactive Waste Manifest (NRC Forms 540, 541, and 542). An explanation or reference for each item is included to assist you in properly completing each form. Sample NRC Forms 540, 541, and 542 are shown as exhibits at the end of these instructions.

The changes between Rev. 3 and Rev. 3 of these instructions are (1) updated instructions to reflect changes to the Uniform Manifest Forms, (2) updated references to U.S. Department of Transportation (DOT regulations to reflect the current DOT regulations, (3) additional discussion on the reporting of inventories based on lower limit of detection values, the potential use of indirect methods to determine these inventories, and the use of indirect methods in waste classification calculations, (4) clarification of the intent of the certification statement on Form 540, and (5) overall improvements to the clarity of the document.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)
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