



C O M P L E X S O L U T I O N S

**Low-Level Radioactive Waste Disposal
Andrews, Texas**

**Federal Waste
Disposal Facility
(FWF)
Generator Handbook**



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Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ALARA	As Low As Reasonably Achievable
ASTM	American Society for Testing and Materials
atm	Atmospheres
CFR	Code of Federal Regulations
cm	Centimeter
CRCPD	Conference of Radiation Control Program Directors
CWF	Compact Waste Disposal Facility
DOE	Department of Energy
DOT	U.S. Department of Transportation
DSHS	Texas Department of State Health Services
DU	Depleted Uranium
ELITE	Electronic Inventory Tracking Engine
EPA	Environmental Protection Agency
FWF	Federal Waste Disposal Facility
GTCC	Greater than Class C
HCD	High Container Dose
ICSS	Integrated Customer Service Specialist
ID	Identification
IHTS	Irradiated Hardware Transfer System
IP	Industrial Package
LC	Large Component
LDR	Land Disposal Restrictions
LLRW	Low-Level Radioactive Waste
LLMW	Low-Level Mixed Waste
μCi	Microcurie
MCC	Modular Concrete Canister
mrem/hr	Millirem per hour
MSDS	Material Safety Data Sheet
NA	Not Applicable
nCi/g	nanocurie per gram
NELAC	National Environmental Laboratory Accreditation Conference
NMMSS	DOE / NRC Nuclear Materials Management & Safeguards System
NRC	Nuclear Regulatory Commission
pCi/g	picocurie per gram
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
Rem/hr	Rem per hour
RCRA	Resource Conservation and Recovery Act
R&D	Research and Development
RIS	Reporting Identification Symbol
RML	Radioactive Materials License
SNM	Special Nuclear Material
TAC	Texas Administration Code
TCEQ	Texas Commission on Environmental Quality
THSC	Texas Health and Safety Code
UHWM	Uniform Hazardous Waste Manifest
TLLRWDC	Texas Low Level Radioactive Waste Disposal Compact Commission aka Texas Compact Commission
ULLRWM	Uniform Low Level Radioactive Waste Manifest
WAP	Waste Acceptance Plan
WCS	Waste Control Specialists LLC



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1.0 OVERVIEW

The purpose of this document is to promote efficient utilization of WCS by the federal government and its contractors (i.e., generators). This handbook provides guidance and specific criteria for waste acceptance at the FWF in compliance with WCS licenses, permits, and procedures.

WCS has two LLRW disposal facilities; the Compact Waste Disposal Facility (CWF) and the Federal Waste Disposal Facility (FWF). The CWF accepts commercial LLRW that is generated in a host state or party state or LLRW that is not generated in a host state or party state, but has been approved for importation to the state by the Texas Compact Commission. The FWF accepts LLRW and Low Level Mixed Waste (LLMW) that is the responsibility of the Federal government under the LLRW Policy Act as amended by the LLRW Policy Amendments Act of 1985 (Department of Energy (DOE) waste, U.S. Navy vessel decommissioning waste, government atomic weapons Research and Development (R&D), testing or production waste, excluding Greater than Class C). The focus of this Generator Handbook is on the FWF.

2.0 DEFINITIONS

2.1 Bulk Waste in Reusable Packages

Waste that is not disposed in the DOT container that it is shipped in, and is not placed in a Modular Concrete Canister (MCC) for disposal. Bulk waste is acceptable for disposal in the FWF, if it is Class A and has a dose rate of <100 mrem at 30 cm.

2.2 Cask Waste

This waste category consists of any waste that must be shielded to meet shipping requirements, any waste shipped in Type A, Type IP-2 DOT cask or Type B Nuclear Regulatory Commission (NRC) cask regardless of dose rate, and any container with a dose rate greater than 1 Rem/hr at the surface of the unshielded container.

2.3 Containerized Waste

Waste that is received in a container and the container is placed in an MCC for disposal. Containerized waste can be bulk or non-bulk as long as the container fits inside the MCC. Dimensions of the standard sized MCCs are listed in Section 5.2.6.

2.4 Electronic Inventory Tracking Engine (ELITE)

A web-based database used by customers to submit profiles and shipment requests online. The same database is used by WCS to approve profiles and shipment requests as well as maintain inventory and disposal information. WCS requires that all profiles and shipment requests be submitted through this database.

2.5 Federal Waste

LLRW and LLMW that is the responsibility of the Federal government under the LLRW Policy Act as amended by the LLRW Policy Amendments Act of 1985 [i.e., Department of Energy waste, U.S. Navy vessel decommissioning waste, government atomic weapons research and development, testing, or production, excluding Greater than Class C waste (GTCC)].



2.6 Head Space

Head space is the empty volume of a waste container between the top of the waste and the top of the waste package. The term head space is used, as opposed to void space, when the waste type has minimal interstitial space within the waste in the container (e.g., resin, soil, sludge, compacted debris, etc.).

2.7 High Container Dose Rate Waste (HCD)

This waste category consists of all unshielded, containerized wastes, where 90% or more of the containers have a dose rate between 100 mrem/hr @ 30 cm and 1 Rem/hr at the surface of the container. Containerized wastes that would otherwise fall into the containerized soil or containerized debris categories, but will not be opened due to specific health and safety issues will be managed in the same manner as HCD wastes.

2.8 Large Component (LC)

Any equipment or large item that will not fit into a standard MCC and other waste for which disposal within an MCC may not be desirable.

2.9 Modular Concrete Canister (MCC)

Cylindrical or rectangular reinforced concrete canister that when properly filled with waste and grout meets the stability requirements found in 30 Texas Administrative Code (TAC) 336.362(b)(2) and conforms to the TCEQ regulatory requirements of retrievability. See [Section 5.2.6](#) for more information.

2.10 Source Material

Uranium or thorium, or any combination thereof, in any physical or chemical form; or ores that contain, by weight, 0.05% or more of uranium, thorium, or any combination thereof. Source material does not include special nuclear material.

2.11 Void Space

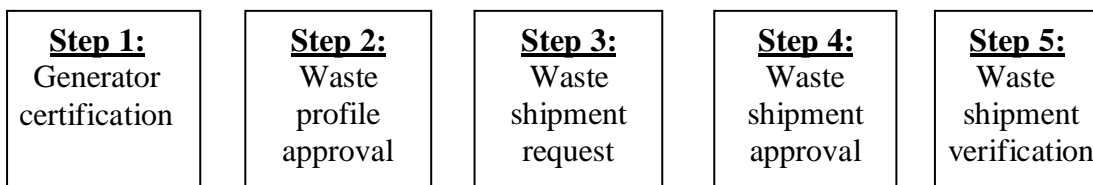
Void space is the empty volume of a waste container including the space between the top of the waste and the top of the waste package, and the interstitial space within the waste in the container. The term void space is used, as opposed to head space, when the waste type has more than minimal interstitial space between the waste pieces in the container (e.g., debris, irradiated hardware, filters, etc.).



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3.0 OVERVIEW OF WASTE ACCEPTANCE PROCESS

See *Appendix 1 – Generator Steps to Disposal* for an additional graphic.



4.0 STEP 1: GENERATOR CERTIFICATION

All generators must be certified by WCS in accordance with our Quality Assurance (QA) Generator Certification Program prior to sending waste to WCS for disposal. For DOE sites with multiple contractors/subcontractors, the contractor that has primary responsibility for waste management should go through the certification process. Other contractors/subcontractors at the same DOE site will be able to utilize another contractor’s certification if the certified contractor’s waste management procedures are utilized for the various waste management activities. Any entity that provides information upon which the classification and/or the characterization of a waste is based, or handles the waste prior to shipment to the WCS facility will be included in the generator certification process. For example, if a DOE prime contractor uses a subcontractor to perform waste management activities the processes and procedures for the subcontractor will be included in the review during the generator certification process to ensure those operations are sufficient to meet the requirements of the WCS license.

The certification process begins with completion and submittal of a generator certification packet. WCS suggests that the generator or customer submit this information as early as possible to ensure approval well in advance of the desired shipping date. WCS will accept generator certification packets without a signed contract but will generally not give final approval of the generator certification until an executed contract is in place.

Each generator certification packet may be associated with multiple waste profiles, one profile for each waste stream the generator proposes to ship to WCS. Onsite audits will be conducted as required in Section 4.2. Approved generators will receive a generator certification identification number valid for 12 months. The generator certification identification number must be renewed through the generator certification process on an annual basis. The WCS QA department will normally contact the generator 90 days in advance of the certification expiration to start the renewal process.

Only generators with an approved generator identification number will be authorized to ship waste to the FWF. The generator’s certification identification number is required on all documentation and correspondence to WCS regarding waste disposal at WCS LLRW disposal facility.

Generators who ship wastes to the FWF that do not meet regulatory requirements or otherwise result in the occurrence of a major discrepancy will be designated as non-compliant (see [Section 8.1](#) for definitions of minor, moderate, and major discrepancies). WCS will suspend the generator identification number of any generator designated as non-compliant. Generators found to be non-compliant must apply for re-certification by resubmission of the generator certification packet. The resubmitted packet must be revised to reflect measures taken to prevent the



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reoccurrence of the violation that resulted in the non-compliance. Non-compliant generators are also required to undergo the site audit process to qualify for re-certification. See [Section 8.1](#) for additional information on non-compliant waste and waste shipments.

4.1 Generator Certification Packet Submittal

Each generator shall submit a generator certification packet to WCS to obtain certification. The generator certification packet must contain documentation of all of the following programs as applicable:

- The waste classification/characterization program, including sampling and analytical procedures and frequencies, quality assurance/quality control procedures, procedures for documenting free liquids and void space, procedures for verification of Land Disposal Restriction (LDR) status (for LLMW), and procedures for verification that LLRW is not hazardous
- The program for determining the presence or absence of chelating agents, and, where chelating agents are present or potentially present, the methodologies for establishing a conservative upper bound for the typical concentration of chelating agents in each waste, and the basis upon which the methodologies provide a conservative upper bound of chelating agent concentrations
- The process control program identifying the procedures and systems in place to maintain consistency in the generating process and resultant wastes (required only when process knowledge is used in characterizing a waste)
- The waste packaging and shipping program
- The personnel training program applicable to persons responsible for all component steps in performing waste classification, characterization, packaging, and shipping
- Records concerning their relevant compliance history. This includes results of regulatory inspections and compliance audits and resolution of any alleged non-compliant conditions or practices that would impact the generator's waste program

4.2 Onsite Generator Audits

All FWF generators will be required to undergo an onsite audit. This audit will encompass verification and review of the generator's waste classification, characterization, chelating agent documentation, packaging, shipping, and other programs, practices, and records associated with waste generating activities.

WCS will develop an audit plan for each generator to be audited. The plan will include audit procedures and/or checklists that reflect specific elements of the programs submitted in the generator certification packet to determine compliance with applicable licenses, permits, plans and procedures. The following activities may be conducted by an auditor as part of the generator site audit:

- Observe or verify onsite waste handling procedures, including transfer, storage, processing, packaging, and shipment preparation procedures
- Interview personnel with direct and supervisory responsibility for waste classification/characterization and waste handling
- Observe or verify the actions taken to ensure that wastes shipped to the LLRW facilities meet each waste acceptance criterion (absence or quantity of free liquids, void space in containers,



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- non-hazardous waste determinations for LLRW, LDR compliance for LLMW, etc.)
- Observe or verify the performance of measurements, analyses, calculations, or other methods used to classify and characterize radioactive waste
 - Review records documenting use of chelating agents and the basis for the generator's waste profile information regarding chelating agents
 - Review radioactive waste characterization records for waste shipments made during the previous year, regardless of the facility to which it was shipped, including, as applicable, process knowledge documentation. The number of shipments reviewed is typically a small sampling of the past year's shipments, but is at the discretion of the auditor.

5.0 **STEP 2: WASTE PROFILE AND WASTE CLASSIFICATION**

A waste profile must be completed in ELITE for each authorized waste stream or appropriate combination of authorized waste streams that a generator intends to ship for disposal at the FWF. Any section not applicable on the form must be marked as "Not Applicable" or "NA." WCS will not accept blank input fields. Combining authorized waste streams will be evaluated on a case by case basis and approval will be determined based on similarities of the required waste acceptance verification requirements and the operational handling and disposal processes. See additional discussion in Section 5.1 for additional guidance. In addition to completing the form in ELITE and attaching any supporting documentation, the generator is required to attach a signed copy of the printed profile from ELITE prior to hitting the "Submit" button.

The generator is encouraged to include information in the profile related to container processing and handling. For example, it is helpful to include in Section 2 of the Profile, *Process Generating Waste*, notice if the waste meets the void space requirement (see 5.2.4). Similarly, in Section 6, in the text box to list DOT Packing Types, it is helpful to note if there any special considerations related to package loading or unloading. Attachments may also be uploaded as needed to upload any other relevant information about the waste, packaging, or shipment practice.

The completed waste profile and supporting documentation must allow WCS to demonstrate that the waste is compliant with regulatory requirements along with license and permit conditions applicable to the LLRW disposal facility. The completed profile form provides an overview of the waste stream and its physical, chemical, and radiological characteristics. The following radionuclides are required to be placed on a waste profile when present:

- Enriched U-235, enriched U-233, Pu-239, and Pu-241 [Special Nuclear Material (SNM)]
- Radionuclides that are required to be listed in accordance with the latest version of NUREG/BR-0204, *Instructions for Completing NRC's Uniform Low-Level Radioactive Waste Manifest*.
- Radionuclides that are required to be listed in accordance with 49 Code of Federal Regulations (CFR) Part 173.433(c)(2)
- Radionuclides that affect the dose rate of a package or shipment
- Uranium and/or thorium considered source material

In addition, the subsequent shipping documentation must include only radionuclides that were previously identified on the approved waste profile. Consequently generators should consult



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NUREG/BR-0204 for guidance on other radionuclides that should be identified on the waste profile (e.g. hard to detect isotopes below the limits of detection).

Analytical data and/or documentation of process knowledge are submitted with the waste profile. The data must be accompanied by an identification of the analytical method used for each parameter or constituent reported, and by QA/QC results. The generator must employ analytical methods approved by recognized entities (i.e., EPA, DOE, ASTM, or AASHTO) for waste analyses supplied with the waste profile whenever possible. The generator may conduct analyses via other industry-accepted methods as necessary to classify and characterize the waste; however, the need to use these other methods must be documented by the generator. Refer to Section 5.4 for additional information on laboratory selection.

The generator may use process knowledge to characterize waste in completing the waste profile, as long as there is reasonable assurance that this approach can be correlated by bounding or other relationships to actual measurements or known quantities. Process knowledge alone may be sufficient to adequately characterize a waste (e.g., spill cleanup residues from a previously characterized waste; containers that have been emptied of their prior contents where the composition of the prior contents is known). Process knowledge may include use of scaling factors to develop inferred concentrations of radionuclides based on measured concentrations of other radionuclides or radionuclide material accountability. Documentation of the generator's process control program will be required if process knowledge will be used in characterizing a waste stream that is a routinely-generated waste resulting from a commercial or industrial process.

For other waste streams, including demolition wastes and other debris, the generator must thoroughly document the basis for classification and characterization of the waste stream and include any pertinent analytical data or known composition information for chemical and radioactive materials with which the waste materials may have been in contact.

The generator's waste profile and supporting documentation, in conjunction with the information in the generator's certification packet, must demonstrate reasonable assurance that the waste is correctly classified as Class A, Class B, or Class C in accordance with the waste classification tables in 30 TAC §336.362, Appendix E, as summarized in the Waste Classification Table 1 and 2 below; that any and all hazardous characteristics and constituents have been identified; and that the concentration of any chelating agents have been conservatively established. The combined documentation must include the methodology used to classify/characterize the waste and the basis upon which the classification and characterization was established and demonstrate that the basis for classification/characterization is adequate and appropriate.

Generators are required to re-certify the waste profile information on an annual basis or when the process generating a waste or the characteristics of a waste changes from the information presented in the current waste profile. A new waste profile must be submitted to WCS for review and approval prior to scheduling additional shipments of the waste.

Table 1 – 30 TAC §336.362 Appendix E, Table I, Class A and C Waste - Long Lived Isotopes

Radionuclide	Class A Limit		Class B Limit		Class C Limit	
	Value	Unit	Value	Unit	Value	Unit
C-14	0.8	Ci/m ³	¹	Ci/m ³	8	Ci/m ³
C-14 in Activated Metals	8	Ci/m ³	¹	Ci/m ³	80	Ci/m ³
Ni-59 in Activated Metals	22	Ci/m ³	¹	Ci/m ³	220	Ci/m ³



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Radionuclide	Class A Limit		Class B Limit		Class C Limit	
Nb-94 in Activated Metals	0.02	Ci/m ³	¹	Ci/m ³	0.2	Ci/m ³
Tc-99	0.3	Ci/m ³	¹	Ci/m ³	3	Ci/m ³
I-129	0.008	Ci/m ³	¹	Ci/m ³	0.08	Ci/m ³
Alpha-emitting transuranic radionuclides with half-lives greater than five (5) years	10	nCi/g	¹	nCi/g	100	nCi/g
Pu-241	350	nCi/g	¹	nCi/g	3,500	nCi/g
Cm-242	2,000	nCi/g	¹	nCi/g	20,000	nCi/g
Ra-226 ²	10	nCi/g	¹	nCi/g	100	nCi/g

There are no limits established for these radionuclides in Class B wastes

² This isotope is not listed in the classification tables in 10 CFR Part 61 but is required by the state of Texas to be included in classification determination

Table 2 – 30 TAC §336.362 Appendix E, Table II, Class A, B and C Waste - Short Lived Isotopes

Radionuclide	Class A Limit		Class B Limit		Class C Limit	
Total radionuclides with half-lives less than five (5) years	700	Ci/m ³	³	Ci/m ³	³	Ci/m ³
H-3	40	Ci/m ³	³	Ci/m ³	³	Ci/m ³
Co-60	700	Ci/m ³	³	Ci/m ³	³	Ci/m ³
Ni-63	3.5	Ci/m ³	70	Ci/m ³	700	Ci/m ³
Ni-63 in Activated Metals	35	Ci/m ³	700	Ci/m ³	7,000	Ci/m ³
Sr-90	0.04	Ci/m ³	150	Ci/m ³	7,000	Ci/m ³
Cs-137	1	Ci/m ³	44	Ci/m ³	4,600	Ci/m ³

³ There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other radionuclides in Table 2 determine the waste is Class C independent of these radionuclides.

For the purpose of the Federal Waste Facility, WCS is authorized to accept for disposal, waste which is handled, treated, packaged, or characterized in accordance with applicable Department of Energy orders, policies, and procedures. Waste class applies when the waste is manifested for transport, regardless if a waste class has been assigned on the manifest documents. NRC waste classification shall apply and shall be limited to Class A, B, and C.

5.1 ELITE Software Registration

WCS has developed a web-based database, named ELITE that is used by customers to submit profiles and shipment requests online. The same program is be used by WCS to approve profiles and shipment requests as well as maintain inventory and disposal information. WCS requires that all profiles and shipment requests be submitted through this website. Users will have the ability to create profiles and shipment requests as well as attach all necessary supporting documentation. Generators using LowTrack™, eMWaste™ (Attention IT), RADMAN™ (WMG Inc.), or ISIP (DW James Consulting) can upload electronic NRC Forms 540, 541 or 542 into ELITE at the time of shipment request. Generators using NAC Reporter™ (NAC International) or other software to generate an unclassified NMMSS-readable NRC Form 741 data file may transmit the data to WCS electronically in addition to the hardcopy accompanying the manifest.



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WCS suggests that each generator register for an ELITE account early in the generator certification process to expedite the process. A physical signature from an authorized agent of the generator will still be required on all forms and manifests. Please contact WCS for more details and assistance.

5.2 Limitations

Some of the limitations below are also captured in *Appendix 2 – Waste Stream Restrictions*

5.2.1 License Volume and Curie Limitations

- Federal LLRW volumes shall not exceed a total of 26,000,000 cubic feet of waste with a total decay corrected quantity of radioactivity not to exceed 5,600,000 curies, and of the total volume 8,100,000 cubic feet can be containerized waste with a total quantity of radioactivity of containerized waste not to exceed 5,500,000 curies.

5.2.2 Chelating agents

- Limited to 8% by weight for each waste stream (e.g., profile)

5.2.3 Free liquids

- Must not exceed 1% of the volume in containerized waste (WCS can dewater/absorb free liquid in non-bulk waste as an additional service upon receipt when requested)
- No free liquids may be present in bulk waste
- Absorbents used to absorb free liquids must be non-biodegradable and capable of absorbing the liquids
- Liquids must be solidified in sufficient absorbent material to absorb twice the volume of liquid

5.2.4 Void Space/Head Space

This requirement is for containerized waste only

- Must be reduced to the extent practicable
- LLRW can have no more than 15% void space/headspace
- LLMW can have no more than 10% void space/headspace

NOTE: WCS may request an exemption from TCEQ for to allow disposal of LLRW with > 15% void space/headspace if meeting the requirement presents ALARA or other safety or technical concerns. Contact WCS if exception to the 15% void space requirement is needed.

5.2.5 Void Filling/Solidification Agents

Void filling/solidification agents are required to be non-biodegradable. Two examples are vermiculite and concrete. There is not an approved list of void filling/solidification agents.

NOTE: WCS has the ability to dewater/void fill containers to meet the free liquids and/or void space/head space criteria for containers shipped directly to the FWF prior to disposal. Contact your WCS Business Development representative to ensure proper contracts are in place for this service

5.2.6 Waste Packaging

- Each package or container shall only contain one approved profiled waste stream. See Section 5.0 for combining approved waste streams in a single profile
- Packages should weigh 10,000 lbs or less unless special arrangements have been made.
- Drums exceeding 1,000 lbs must be palletized and banded unless alternate arrangements are made with WCS
- All containers transported on public roads to WCS are required to meet the applicable requirements of the Texas Department of State Health Services (DSHS) and DOT regulations (49 CFR)
- Cardboard, fiberboard, and wood boxes are prohibited
- Except for bulk waste in reusable containers and Large Components, waste packages must fit into a MCC. WCS has two standard types of MCCs:
 - Cylindrical: 6' 8" D x 9' 2" H (internal dimension)
 - Rectangular: 9' 6" L x 7' 8" W x 9' 2" H

5.2.7 Waste Class

The FWF is authorized to receive containerized Class A, Class B, and Class C (as defined in 30 TAC §336.362) LLRW & LLMW and bulk Class A LLRW and LLMW in reusable packages with a dose rates of <100 mrem/hr at 30 centimeters.

5.2.8 Waste Form

- Containerized debris and bulk debris in reusable packages must contain greater than 50% debris
- Containerized soil and soil-like and bulk soil in reusable packages must contain less than 50% debris

5.2.9 Waste Stability Requirements

- The MCC disposal structure provided by WCS will provide the stability required for radioactive waste in accordance with 10 CFR 10 CFR §61; therefore, the waste or the waste form as shipped to WCS is not required to meet stability requirements.
- All Class B and C, and HCD Class A waste will be placed in an MCC.

5.2.10 Transportation

Transportation by highway and rail are acceptable means for delivery of waste to the FWF.

5.2.11 Prohibited Wastes Types

- Waste streams not specifically authorized by the license or with physical, chemical, and radiological characteristics not evaluated in the license application
- Waste of international origin [THSC §401.207(0)]
- Greater than Class C (GTCC) waste
- Naturally-occurring radioactive material (NORM) waste including oil & gas NORM
- Byproduct material waste [11.e(2)]



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- High-level radioactive waste
- Uranium hexafluoride
- Waste capable of generating toxic gases, vapors, or fumes (excluding radioactive gases)
- Waste readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures or of explosive reaction with water
- Waste containing transuranic nuclides in concentrations greater than 100 nCi/g
- Municipal solid waste
- Liquid waste that is not stabilized or not solidified
- Explosive materials
- Pyrophoric material that has not been properly stabilized
- Putrescible waste
- LLMW containing RCRA codes F020, F021, F022, F023, F026, and F027 (Dioxins & Furans)
- Waste that is NOT considered Federal Waste.

5.3 Pre-Shipment Samples (Soil & Soil-Like Waste)

Pre-shipment samples are required during the profile approval process for soil and soil-like waste streams that are < 100 mrem/hr @ 30 cm. WCS will contact the generator when a pre-shipment sample is required and what the requirements are for providing the pre-shipment sample to WCS.

NOTE: Do not send pre-shipment samples unless specifically requested by WCS.

5.4 Laboratory Accreditation

Analytical data from samples measured by a laboratory can only be accepted if the laboratory is National Environmental Laboratory Accreditation Conference (NELAC) accredited by the Texas Laboratory Accreditation Program operated by the TCEQ or the data are exempt from the NELAC-accreditation requirement under one of the following criteria [30 TAC §25.6]:

- The laboratory is an on-site or in-house environmental testing laboratory that
 - is inspected at least every three years by the executive director,
 - is located in another state and accredited or periodically inspected by that state, or
 - gets inspected at least every three years by the executive director and is performing work:
 - for another company with a unit located on the same site, or
 - without compensation for a governmental agency or a charitable organization.
- The lab is accredited under federal law, including certification by the United States Environmental Protection Agency to provide analytical data for decisions relating to compliance with the Safe Drinking Water Act. TCEQ has interpreted this to include DOE on-site labs that are subject to DOECAP audits as labs that are operating under federal law.
- The lab supplies analytical data necessary for emergency response and the required analytical data are not otherwise available from an environmental testing laboratory that is accredited by the TCEQ or federal law.
- The lab supplies analytical data for which the commission does not offer accreditation (i.e.,



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in-situ gamma spectroscopy).

A list of laboratories accredited by the TCEQ and the accredited analytical methods is available at www.tceq.state.tx.us/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf.

5.5 DSHS Shipper and Transporter Registration

All entities appearing as either Shippers (generators) or as Carriers (transporters) on NRC Form 540 must be registered with DSHS prior to disposal in Texas. Shippers and transporters must submit documents described in DSHS Regulatory Guide 2.19, *Guide for Submission of Documents and Fees by Low Level Radioactive Waste Shippers and Transporters*, to DSHS at least fourteen (14) days prior to the first shipment departure.

WCS maintains a current list of DSHS-approved shippers and transporters for disposal of LLRW in Texas. Registration for shippers is valid for up to ten (10) years, and registration for transporters must be renewed annually at the time of insurance renewal. WCS will not approve shipment requests from entities without current DSHS registration. Registration assistance is available from WCS' Customer Service Department and from DSHS.

6.0 **STEP 3: WASTE SHIPMENT REQUEST**

Each shipment of waste to WCS must be pre-approved. Once a generator has completed generator certification, and has an approved profile from WCS, then the generator can request to make a shipment to WCS using ELITE.

The generator must fill out a Waste Shipment Request form in ELITE and submit the completed form along with an advanced copy of the shipping documents that will accompany the shipment ***at least 5 business days in advance of the requested delivery date***. A list of required documentation, as applicable, is listed below:

- NRC Form 540/541/542 *Uniform Low Level Radioactive Waste Manifest* (ULLRWM)
- NRC Form 741/742 Nuclear Transaction Form
- US EPA Form 8700-22, Uniform Hazardous Waste Manifest (UHWM)
- Land Disposal Restriction (LDR) notification(s)
- Asbestos Record of Shipment
- PCB Continuation Sheet

When completing the shipping request in ELITE, under the Attachments tab in the Customer Remarks section, it is helpful for the generator to list relevant information about the shipment. For example note if the waste meets the 15% void space requirement (see 5.2.4). This section can also be used to note that dewatering/void fill services are required (see 5.2.5), or to note that dewatering/void fill is not required and to note the date of dewatering. Similarly, it is helpful to note if any special considerations relating to the loading and unloading of the packages. (See 5.2.6)

6.1 Pre-Shipment Notifications

6.1.1 Advanced Shipment Notification to TCEQ

In addition to the notification to WCS, every waste shipment will require WCS to notify TCEQ ***five (5) business days prior to shipment departure*** for verification and tracking purposes.



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6.1.2 Advanced Shipment Notification to DSHS

Five (5) business days prior to shipment departure, each shipper shall notify DSHS providing a copy of the waste manifest and the date of shipment. WCS performs the DSHS notification on behalf of the shipper, unless the shipper requests otherwise. The notification may be submitted by facsimile to (512) 834-6690, email to Jennifer.Ludwig@dshs.state.tx.us and ray.fleming@dshs.state.tx.us or to:

US Mail: Texas Department of State Health Services
Radioactive Material Licensing – MC 2835
P.O. Box 149347
Austin, TX 78714-9347

UPS/FedEx: Texas Department of State Health Services (512) 834-6688
Radioactive Material Licensing – MC 2835
ATTN: Ray Fleming
8407 Wall St
Austin, TX 78714

6.1.3 Neutron Sealed Sources

The generator must notify WCS and TCEQ of the intent to ship a neutron sealed source. The notification must consist of telephone and written notification *prior to the five day advanced notification*. The notification needs to include the following information:

- Isotope
- Activity
- Form of the source
- Description of the packaging utilized
- Radiological data
- Requested date of arrival

NOTE: A copy of the Neutron Sealed Sources notification must accompany the shipment.

6.1.4 Nationally Tracked Sources As Defined In 10 CFR §20.1003

Prior to shipping, the generator must provide WCS and TCEQ the following information:

- Generator's name, shipping address, radioactive material license number, and name of individual preparing the reported information
- The manufacturer, model, and serial number of the source, or if not available, other information to uniquely identify the source
- The radioactive material in the source and the current activity in Becquerels (Bq) and Curies (Ci). The activity reported must be the same as the activity that will be listed on the shipment manifest
- The date the source strength is reported
- The requested shipping date and estimated arrival date
- The waste manifest number and the waste disposal container number



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6.1.5 Lead Used For Radiation Shielding Purposes

6.1.5.1 Contaminated lead or lead that will be considered part of the waste stream as D008

Waste streams that will be shielded with contaminated lead will be considered mixed waste and subject the RCRA disposal requirements found in 40 CFR Part 268.

6.1.5.2 Non-Contaminated Lead used for shielding purposes only

If a customer is using non-contaminated lead as part of the package for the sole purpose of shielding and will not characterize the waste stream as hazardous for lead (D008), prior approval from WCS is required. This approval must be obtained during the profile approval process and **prior to request for shipment**. Generators must provide the following information with the profile submittal:

- Type of lead used (sheet, block, pig, etc.)
- Amount of lead used (in pounds) and a graphic depiction of its location and configuration within the package that will support WCS' dose modeling
- Container type and size
- Description of the waste requiring shielding including waste classification
- Approximate external dose rate prior to shielding
- External dose rate after shielding

6.2 Shielded Shipping Cask Configuration

Include cask model and cask loading configuration information in the shipment request, specifically if the liner will be in a lift bag, retrievable with a grapple or retrievable with slings. For liners with slings, specify if the slings are wire or synthetic.

NOTE: Refer to APPENDIX 4 for additional shielded shipping cask configuration information.

6.3 Shipping Document Information

See *Appendix 4 – NRC Form & UHWM Examples* for illustration of the WCS-specific entries to NRC Forms 540, 541, 542 and 741 and the Uniform Hazardous Waste Manifest (UHWM) described below.

6.3.1 NRC Form 540 Block 5, Shipper I.D. Number

Enter the certified generator's nine (9) character generator certification number assigned by WCS in Block 5 of NRC Form 540.

6.3.2 NRC Form 540 Block 5, Shipment Number

It is optional to enter either data determined by the shipper or the ELITE shipment number in Block 5 of NRC Form 540.

6.3.3 NRC Form 540 Block 5

It is optional to enter either data determined by the shipper or the five (5) character DSHS Shipper Registration number assigned by DSHS in Block 5 of NRC Form 540, under the shipper's address and to the left of the shipment number.



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6.3.4 NRC Form 540 Block 8

The manifest number is typically assigned by the generator. WCS encourages the use of the following format:

FWF-XXXX-##, where XXXX is the four digit profile number, and ## is a sequential number.

6.3.5 NRC Form 540 Block 9, Consignee

Enter WCS as the consignee exactly as shown below in Block 9 of NRC Form 540.

Waste Control Specialists LLC
Federal Waste Disposal Facility
9998 W. State Hwy. 176
Andrews, TX 79714

Contact – Tom Hannah
Phone – (432) 525-8500

6.3.6 NRC Form 540 Block 11, U.S. Department of Transportation Description

Enter your waste profile number in parentheses after your proper shipping name.

6.3.7 NRC Form 541 Block 4, Shipment ID Number

Enter the certified generator's nine (9) character generator certification number assigned by WCS in Block 4 of NRC Form 541.

6.3.8 NRC Form 541 Block 15, Concentration

WCS requests that generators list the concentration of each isotope in picocuries per gram (pCi/g) in Block 15 of NRC Form 541. If this is not possible, upload an Excel® spreadsheet with pCi/g information for each row of isotopic data on NRC Form 541 as an attachment to the ELITE shipment request.

6.3.9 UHWM Block 8, Designated Facility

Please enter WCS as the designated facility exactly as shown below in Block 8 of UHWM.

Waste Control Specialists LLC
Federal Waste Disposal Facility
9998 W. State Hwy. 176
Andrews, TX 79714
(432) 525-8500

EPA ID – TXR000075788

6.3.10 UHWM Block 13, Waste Codes

In addition to entering EPA hazardous waste codes, enter the 8-character Texas Waste Code in two adjacent blocks on the same row, if space permits.

6.3.11 UHWM Block 14, Special Handling Instructions

The waste profiles for each line item must be specified in Block 14. The identification number of the shipping container for bulk containers should be entered. The rail equipment number and corresponding intermodal equipment number(s) must be entered.



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6.3.12 NRC Form 741 Reporting Identification Symbol (RIS)

WCS' unclassified Reporting Identification Symbol (RIS) for the FWF is VAD. Generators using NAC Reporter™ (NAC International) or other software to generate an unclassified NMMSS-readable NRC Form 741 data file may transmit the data to WCS electronically in addition to the hardcopy accompanying the manifest.

6.3.13 NRC Form 741 Block 9, Receiver Data

It is optional to enter WCS' address and Texas radioactive materials license number, R04100.

6.3.14 NRC Form 741 Block 23a, Manifest Number

WCS requires customers to list the ULLRWM and UHWM number(s) in the miscellaneous box on the DOE/NRC Form 741/741A.

6.3.15 NRC Form 741 Block 24, Total Gross Weight

Enter the gross weight of the disposed waste rounded to the nearest whole kilogram from Form 541. Do not include the weight of reusable shipping containers that will not be buried (i.e., Type A and B shielded casks).

6.3.16 NRC Form 741 Block 25, Total Volume

Enter the volume of the disposed waste rounded to the nearest whole cubic foot from Form 541. Do not include the external volume of reusable shipping containers that will not be buried (i.e., Type A and B shielded casks).

6.3.17 DSHS Shipper and Transporter Registration Number(s)

DSHS shipper and transporter registration number(s) is not required on the shipping documents. If included, it is suggested to enter it in Block 5 of Form 540, under the shipper's address and to the left of the shipment number.

7.0 STEP 4: WASTE SHIPMENT APPROVAL

WCS will review the Waste Shipment Request form and the associated shipping documentation. WCS will work with the generators to promptly process and approve or resolve any discrepancies or address any concerns associated with the shipment request.

Once WCS is satisfied with the shipping documentation and has approved the delivery of the shipment, WCS will provide the generator with a Waste Shipment Approval form. This form will contain the scheduled date and time for delivery of the shipment. This form is WCS's indication to the generator that they are authorized to ship the waste for disposal at the FWF.

NOTE: WCS will not approve a shipment request unless both the Shipper and Carrier on NRC Form 540 hold current DSHS registration.

7.1 WCS-Specific Waste Package Marking

Each package, except for Cask Waste, must be marked with the information specified below:

- Generator name (as listed on the associated profile)
- Waste profile number associated with the container (one waste profile per container)
- Manifest number



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- Generator's unique package ID number
- Gross weight of container in pounds

NOTE: Based on As Low As Reasonable Achievable (ALARA) principles, generators may make arrangements with WCS to convey this information in a different manner.

7.2 Pre-Arrival Documentation

Provide electronically to DL_WCS_Shipping_Docs@wcstexas.com on or before the day of departure:

- Final manifest documents if there are changes from the ELITE submission
- Driver(s) name as it appears on their commercial driver license (CDL) and driver's cell phone number
- Notification if the vehicle will arrive with waste or freight not for disposal in the FWF (i.e., brokered shipment on a "milk run")
- Pre-shipment departure radiological survey of the vehicle
- Waste container radiological surveys including fixed and removable contamination and the maximum dose rate at one (1) foot for each item
- Cask shipments only, provide:
 - Radiological survey of the empty cask, including fixed and removable contamination data and dose rate information
 - Maximum contact dose rate on the exterior of the closed primary lid of the loaded cask for ALARA planning

8.0 STEP 5: WASTE SHIPMENT VERIFICATION

Waste verification will be performed on incoming shipments. The method and frequency will depend on the type of waste. See *Appendix 5 - Waste Verification Requirements* for additional details.

The following wastes are excluded from intrusive sampling or inspection due to ALARA and health and safety concerns and will be treated as high container dose rate waste during the generator certification and waste verification processes:

- Waste that could release radon or tritium gas upon opening
- Waste that could release fine, dispersible radioactive particulates upon opening (e.g., ash)
- Biohazard waste
- Waste with sharps from any source

8.1 Non-Compliant Waste or Waste Shipments

- Non-compliant waste containers or shipments will be addressed on a case by case basis through the WCS discrepancy resolution process
- There are three types of discrepancies:
 - **Minor discrepancy** - Discrepancies that do not affect the safe and appropriate management of the waste in accordance with license conditions and regulatory requirements, and do not result in a nonconformance between the waste shipment and the



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waste profile. (e.g. Department of Transportation (DOT) marking or labeling discrepancies)

- **Moderate discrepancy** - Discrepancies that would not normally result in a non-compliance with license conditions, but may have minor regulatory impacts. (e.g. a waste form that is otherwise compliant with the license and permits and would require a profile modification with minimal impacts to operations)
 - **Major discrepancy** - Discrepancies identified that could result in a non-compliance with license conditions and/or regulatory requirement that has the ability to adversely affect members of the general public, site employees and/or the environment; to include discrepancies between the characteristics of the shipped waste and the waste profile that are indicative of substantive differences (i.e. wastes that are different in type from that profiled)
- Generator certification status will be affected by repeatedly sending discrepant waste or waste shipments to WCS. Minor or Moderate discrepancies that are addressed by the generator in a timely manner to the satisfaction of WCS do not usually affect the generator's current status although points may be assessed..
 - If the generator chooses, WCS has the capability to mitigate some discrepancies at the adjacent processing facility.

8.2 TCEQ Resident Inspector

- The TCEQ resident inspector may inspect every waste shipment and manifest received at the disposal facility for proper classification and characterization prior to waste acceptance.
- As part of the TCEQ inspection process, the TCEQ reserves the right to inspect manifests, waste shipments, and conduct visual inspections and external exposure rate surveys, as well as any other inspection deemed necessary by the TCEQ
- Waste shipment packaging may be inspected for damage or compromised container integrity by the TCEQ
- All waste shipment inspections shall be conducted in accordance with the TCEQ resident inspector inspection procedures
- Waste class verification may also be performed by the TCEQ resident inspector(s) upon receipt prior to acceptance through inspection procedures

9.0 GENERAL SITE INFORMATION

9.1 Operational and Business Hours

Normal business hours for the facility are Monday through Friday, 8:00 a.m. to 5:00 p.m. Central Time and WCS recognizes Daylight Savings Time. The facility is closed on the following days: New Years' Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the following Friday, Christmas Day and may close for other observances.

Standard waste shipment receiving hours are Monday through Thursday, 8:00 a.m. to 2:00 p.m. Generators may request alternate days and hours for receipt; each request will be evaluated on case-by-case basis by WCS and TCEQ.



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9.1.1 Audits and Tours

WCS must approve all audits and tours in advance. WCS requests a 30-day notice for all audits. Tours should be scheduled a minimum of two weeks in advance. Audits and tours are limited to normal business hours of the facility. Contact Customer Service at (888) 789-2783 for scheduling of these activities.

9.1.2 Viewing Waste as it is Received and Disposed

If a customer would like to observe receipt and disposal of their waste, the facility can customize the schedule to accommodate such activities provided adequate notice is given; however, WCS requests that all visits and viewing be limited to normal operating hours. The facility generally can predict how many hours or days waste stream handling requires. If a customer would like this service, please advise the Customer Service department at the time of waste profiling, and at the latest, five (5) business days before submission of a shipment request through ELITE.

9.2 Demurrage

It is important that transporters arrive at their allotted receiving time. WCS will not compensate generators or transporters for demurrage charges if the transporter is not checked in with the WCS Security Officer at the Main Guardhouse within 15 minutes on either side of the scheduled arrival time. Excessive unload times due to non-conformances will be the responsibility of the generator.

9.3 Decontamination of Vehicles and Reusable Containers

WCS will release vehicles and reusable containers (i.e., casks) in accordance with the following table unless other arrangements were made during contract negotiations.

Table 3 – Radiological Release Standards of Vehicles and Reusable Containers

	Regulatory reference	Non-fixed contamination-beta gamma	Non-fixed contamination-alpha	Other criteria
Vehicles	49 CFR §173.443	2400 dpm/100 cm ²	240 dpm/100 cm ²	Dose <0.5 mrem/hr
Containers	49 CFR §173.428	240,000 dpm/100 cm ²	24,000 dpm/100 cm ²	Dose <0.5 mrem/hr and labeled UN-2908 “EMPTY”
Casks ¹	49 CFR §173.428	240,000 dpm/100 cm ²	24,000 dpm/100 cm ²	Dose <0.5 mrem/hr and labeled UN-2908 “EMPTY”

¹WCS will not decontaminate the interior surfaces of casks that contained irradiated hardware to meet these requirements

9.4 Customer Service Contact Information

Customer Service can be reached at (432) 525-8500 or (888) 789-2783.

WCS receives US Mail, FedEx and UPS deliveries once per day in the late afternoon. Saturday delivery to the site is not available in WCS’ region from US Mail, FedEx or UPS.



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US Mail

Customer Service
Waste Control Specialists LLC
PO Box 1129
Andrews, TX 79714-1129

FedEx

Customer Service
Waste Control Specialists LLC
9998 W. State Hwy 176
Eunice, NM 88231

UPS/Courier

Customer Service
Waste Control Specialists LLC
9998 W. State Hwy 176
Andrews, TX 79714

9.5 Transportation Requirements

9.5.1 Selection of a Transporter

Transporters must be approved by DSHS transportation of LLRW for disposal in Texas. Transporters must submit documents described in DSHS Regulatory Guide 2.19, *Guide for Submission of Documents and Fees by Low Level Radioactive Waste Shippers and Transporters*, at least 14 days prior to the first shipment to DSHS. WCS maintains a current list of DSHS-approved transporters for shipment of LLRW into Texas.

New transporters are welcome to the program, and should contact WCS' Customer Service Department for assistance. All transporters and clients are obligated to meet standard insurance requirements set forth by WCS. The requirements are in the client's Environmental Service Agreement (ESA) or contract document.

9.5.2 Prohibited Items

Weapons are not allowed within the WCS facility. For purposes of this prohibition, "weapons" means firearms, illegal knives, clubs and hoax bombs, all as defined in Section 46.01 of the Texas Penal Code; and also the prohibited items listed in Section 46.05 of the Texas Penal Code. Please note that the list includes, among other things, items such as nightsticks, bowie knives, mace and certain other chemical dispensers (not including small dispensers sold commercially for personal protection). Transporters and other contractors and visitors to WCS site are responsible for familiarizing themselves with the list of prohibited items.

There is no exception from the firearm ban for holders of concealed handgun licenses; they are also not permitted to bring handguns or any of the other prohibited weapons onsite.

Vehicles are subject to search, and those that are discovered to contain a firearm shall be turned away, because WCS does not offer a "check at the gate" option for firearms. Other discovered weapons shall be handled on a case-by-case basis and could also result in turning away the vehicle. WCS shall not be responsible for any delivery delays or demurrages caused by failure to comply with this policy.

Texas Labor Code Chapter 52, Subchapter G, *Restrictions on Prohibiting Employee Transportation or Storage of Certain Firearms or Ammunition* is not applicable to visitors, clients, contractors, generators, brokers or transporters.

Alcoholic beverage containers and illegal drugs are prohibited within the WCS facility.

9.5.3 Site Access

- Drivers entering the site must have in their possession a current CDL with a hazardous material endorsement.
- Drivers are not required to have 24- or 40-hour HAZWOPER training, per 29 CFR 1910.
- All drivers are required to wear Level D Personal Protective Equipment (PPE). This includes a reflective safety vest, hardhat, safety eyewear, and safety toe footwear. Trousers must cover



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the leg and shorts are prohibited for transporters entering WCS.

- Passengers not meeting the same requirements as drivers, minor children and pets will not be granted access.
- Transporters without a complete insurance certificate on file with WCS will not be granted access.

9.5.4 Upon Arrival at the WCS Facility

- The Main Guardhouse is open 24 hours per day, 7 days per week.
- Upon arrival, drivers must report to the Main Guardhouse and check in. If arriving outside of business hours, a WCS Security Officer will indicate a safe location to overnight.
- Annually, drivers must complete required reading and an orientation briefing at the Main Guardhouse.
- Each inbound vehicle is also subject to a safety check. At a minimum, lights, turn signals, horn, tire condition, frame, and registration expiration are typically checked. Vehicles with observed fuel, oil, coolant, hydraulic, or other leaks may be denied access. The shipment may subject to surcharge for trans-loading outside our gate and may be subject to a surcharge to correct vehicle and container faults, and/or clean up incident to vehicle leaks or spills.
- The transport vehicle will be escorted to the FWF by WCS staff.

9.5.5 Transporter Insurance Requirements

Prior to performing work on WCS (Company) property, Contractor (Transporter) shall maintain at its sole cost, the following types and minimum limits of insurance, with insurers acceptable to Company, unless there are different requirements in the customer's contract documents:

- **Business Auto Liability (and/or excess/umbrella liability):** \$5,000,000 each occurrence (bodily injury and property damage combined), for all owned, hired and non-owned vehicles, including trailers, to be utilized in transporting material to a WCS site. Policy must contain an MCS-90 endorsement and an ISO CA 99 48 03 06 (Pollution Liability-Broadened Coverage) endorsement, or equivalent.
- **Workers' Compensation/Employers Liability:** insurance with the following limits:
 - Workers' Compensation – Statutory
 - Employers Liability – \$1,000,000 per occurrence
- To the extent permitted by applicable federal, state and local laws and regulations, all insurance policies required must:
 - Name Waste Control Specialists LLC as the certificate holder, and
 - Name Waste Control Specialists LLC as an additional insured, except under any Workers Compensation or Employer's Liability policy, and
 - Specify that insurers have no right of recovery or subrogation against WCS.

Any subcontractors employed by a transporter shall maintain the same level of insurance required of the transporter and shall waive subrogation in favor of WCS as required above, and name WCS as an additional insured as required above. Alternatively, the transporter's insurance policies may be extended to cover Subcontractor(s).

Prior to the inception of any work performed on WCS property, the transporter shall provide WCS with an insurance certificate(s) as evidence that the required insurance is in force. The



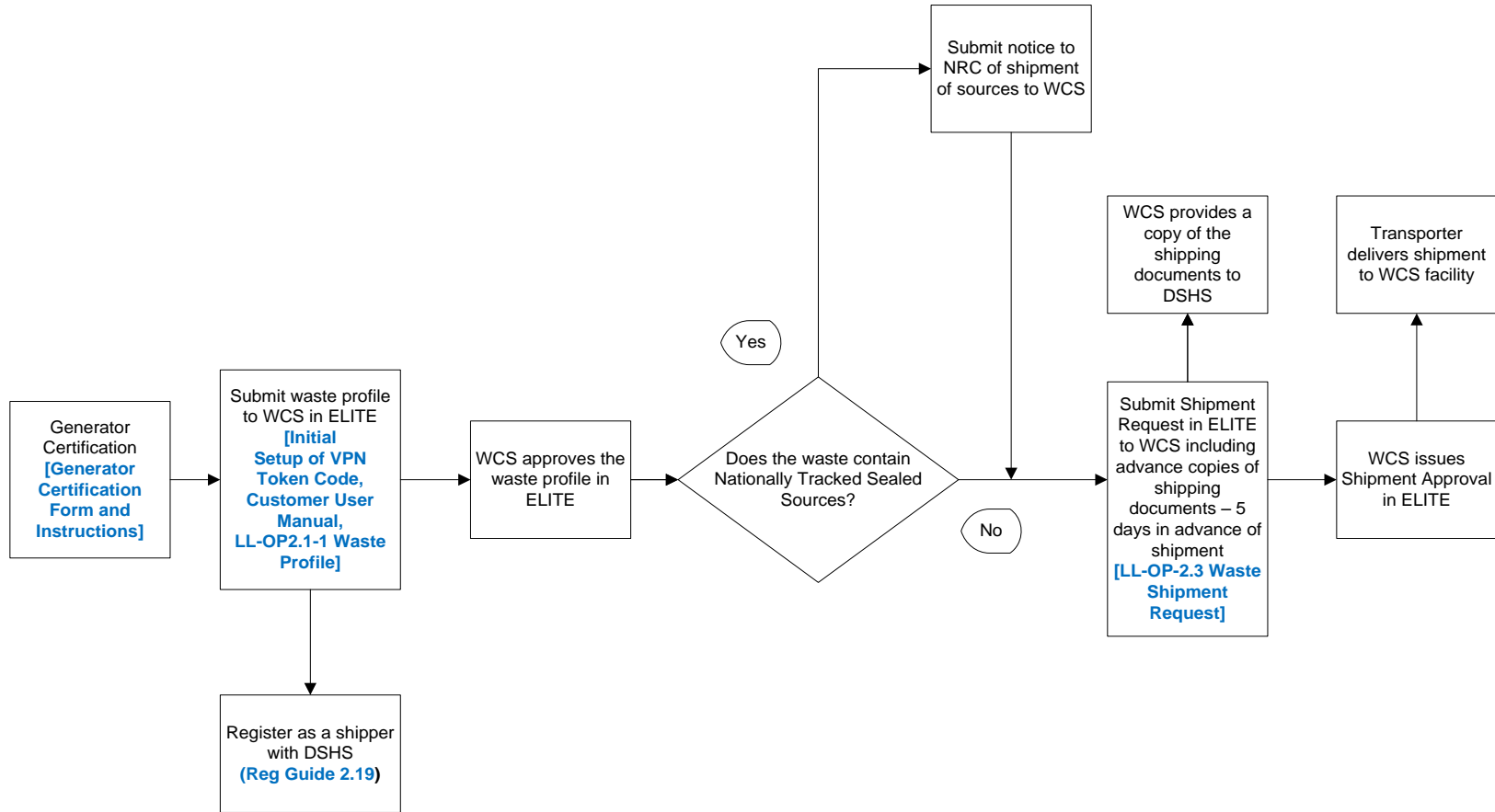
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transporter shall continuously provide renewal certificates to WCS as long as they are performing work on WCS property. All of the transporter's insurance required herein shall be primary to, and shall receive no contribution from any other insurance maintained by, on behalf of, or benefiting WCS. Such certificates shall specify that WCS shall be given (30) days notice prior to cancellation or material change of any of the required policies. If required, the transporter shall provide WCS with the copies of the requested insurance policies.



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APPENDIX 1 – GENERATOR PATH TO DISPOSAL



NRC – US Nuclear Regulatory Commission
DSHS-TX Dept. of State Health Services
ELITE-Electronic Inventory Tracking Engine
WCS-Waste Control Specialists LLC



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APPENDIX 2 – WASTE STREAM RESTRICTIONS

	Bulk Soil	Bulk Debris	Containerized Soil	Containerized Debris	High Dose Rate Waste	Cask Waste
Waste Form	>50% soil	>50% debris	>50% soil	>50% debris	N/A	N/A
Free Liquids	No visible free liquids	No visible free liquids	< 1%	< 1%	< 1%	< 1%
Dose Rate	< 100 mrem/hr @ 30 cm	< 100 mrem/hr @ 30 cm	At least 10% of containers are <100 mrem/hr @ 30 cm	At least 10% of containers are <100 mrem/hr @ 30 cm	90% of containers are >100 mrem/hr @ 30 cm and ≤1 Rem/hr on contact	>1 rem/hr on contact of the unshielded container
Organic Content	As disposed content cannot exceed 5%, and no shipment can exceed 10%	As disposed content cannot exceed 5%, and no shipment can exceed 10%	N/A	N/A	N/A	N/A
Void Space/ Head Space	N/A	N/A	LLRW: Cannot exceed 15% LLMW: Cannot exceed 10% Large Components: Minimize to the extent practical			
Chelating Agents	Maximum of 8% by weight for all waste types for each waste stream (waste profile)					



APPENDIX 3 – ADDITIONAL CRITERIA FOR SPECIFIC WASTE STREAMS

Sealed Sources & Special Form Radioactive Material

According to The U.S. Nuclear Regulatory Commission (NRC), "sealed source" simply means that radioactive material is encased in a capsule designed to prevent leakage or escape of the material. In addition to meeting the definition of a sealed source, "special form" sources must satisfy the following DOT conditions according to 49 CFR 173.403:

1. It is either a single solid piece or a sealed capsule containing radioactive material that can be opened only by destroying the capsule;
 2. The piece or capsule has at least one dimension not less than 5 mm (0.2 in); and
 3. It must satisfy the test requirements of 49 CFR 173.496
- Prohibited from bulk waste in reusable packages in the FWF
 - Must be doubly-packaged and encased in concrete or similar material within the outer package, with the exception of check sources (<100 µCi)
 - For waste classification, the activity can be averaged over the entire package in accordance with the U.S. *NRC Concentration Averaging and Encapsulation Branch Technical Position, Revision 1*, February, 2015
 - The activity concentration of the entire package cannot exceed the limits specified in 30 TAC §336.362(a)(2) for Class C low-level radioactive waste
 - The maximum amount of cesium-137/barium-137 gamma-emitting radioactivity that may be encapsulated in a single container is 30 Ci
 - The maximum amount of transuranic radioactivity other than plutonium-241 and curium-242 that may be encapsulated in a single container is 30 mCi
 - Additional requirements:
 - Encapsulation media shall be in the form of structural grade cement or equivalent
 - See Sections 6.1.3 and 6.1.4 for notification requirements for neutron sources and nationally tracked sources as defined in 10 CFR §20.1003

Biological, Pathogenic or Infectious Waste

- Must be treated to reduce to the maximum extent practicable the potential hazard from the non-radiological materials
- Incineration is the preferred method of treatment for biological, pathogenic or infectious waste
 - Incinerator ash must be solidified or treated in such a manner as to be rendered non-dispersible in air, exclusive of packaging
- Biological waste that is not incinerated must be doubly packaged. Refer to *Appendix 3 - Biological, Pathogenic, Or Infectious Waste Packaging*:
 - Outer container
 - Must have a volume of at least 1.5 times the inner container
 - Initially filled with at least 4 inches of absorbent material



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- After the inner container is placed in the outer container, the remaining volume in the outer container must be filled with absorbent material, then securely closed and properly sealed
- Inner container
 - Capacity of 55-gallons or less
 - Must have a water tight liner at least 4 mils thick and be hermetically sealed after filling
 - The biological material must be thoroughly layered in the inner container in a ratio of 30 parts biological material to at least 1 part slaked lime and 10 parts absorbent, which shall be agricultural grade 4 vermiculite or medium grade diatomaceous earth or other absorbents that have received approval by the executive director by volume.
 - The addition of formaldehyde is prohibited
 - The closure on the inner container shall be standard lid with securely attached ring and bolt. Lever locks are prohibited.
 - Must be placed in an upright position in the outer container

Radioactive Gases

- Must be packaged at an absolute pressure that does not exceed 1.5 atmospheres (atm) at 20°C
- Total radioactivity may not exceed 100 Ci per container

Large Components

- Will be evaluated on a case-by-case basis
- Must be backfilled with grout, if necessary, to ensure voids are filled
- For each LC, WCS will develop and submit an LC-specific disposal plan with the assistance of the generators to TCEQ 90 days in advance of the shipment authorization. An LC specific disposal plan will include a comprehensive and integrated plan that shall include, but may not be limited to the following:
 - Transportation Plan
 - Lifting Plan
 - Disposal Placement Plan
 - ALARA Plan
 - Waste Profile

Bulk Waste in Reusable Packages

- Bulk waste in reusable containers can contain both soil and debris in any combination. The determination to how the waste will be priced (either as debris or as soil) will be based on the approved waste profile.
- The average, in-place organic content cannot exceed 5%, and the average, as received organic content of any individual waste shipment cannot exceed 10% in accordance with ASTM D2974, *Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils*
- Dose rates are less than 100 mrem/hr @ 30 cm
- Waste must comply with the LDRs of 40 CFR Part 268



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Thorium and Uranium Wastes

- If the total activity for uranium (U-Nat or U-Dep) or non-enriched thorium (Th-Nat) is less than one curie, then the isotopes can be identified as Th-Nat, U-Nat or U-Dep as appropriate on the profile and manifests.
- If the total activity for any of the three (Th-Nat, U-Nat or U-Dep) is greater than one curie then the isotopes are required to be broken down to the specific isotopes by the generator in the profile and manifest.

Bulk Waste Containing Friable Asbestos

- All regulated asbestos containing material (RACM) that is friable or otherwise capable of giving off asbestos dust must be wetted with a water and surfactant mix and stored in two plastic bags whose combined thickness equals at least 6 mil. The plastic bags must be overpacked in leak-resistant containers that meet applicable shipping requirements for the radioactive content of the material involved, if applicable. Sharp edges and corners within the package shall be padded or otherwise protected to prevent damage to the inner plastic during handling and shipping. Since the asbestos must be wetted during abatement activities, an absorbent must be added to ensure compliance with the free liquid criteria.
- All RACM shall be packaged, marked, and labeled in accordance with the requirements of 40 CFR §61.150.



APPENDIX 4 – USE OF SHIELDED SHIPPING CASKS

Include cask model and cask loading configuration information in the waste profile, specifically if the liner will be in a lift bag, retrievable with a grapple or retrievable with slings. For liners with slings, specify if the slings are wire or synthetic. Discuss other cask shipment configurations with WCS during the waste profiling process.

Liners in Lift Bags

WCS requests attachment of a ¼” by 20’ recovery line on the original liner lifting cables. Put a brightly colored piece of duct tape on the lifting ends of the bag lifting straps. This enables WCS staff to have an obvious target when fishing for the lifting ends while looking through a mirror.

Straps and slings must be readily accessible beneath the cask primary lid by staff using extended reach tools while located at the side of cask, below the plane of the cask opening. Do not allow lifting straps or slings to slide down between the liner and cask or become tangled.

Grappable Liners

WCS can offload 6-80 and 8-120 poly or carbon steel liners with an installed grapple bale. WCS’ grapple can retrieve 6-80 liners from the bottom of casks; cribbing under the liners is not required.

Liners with Slings

WCS can offload any liner that is loaded into a cask (any Type A, 8-120B or 10-160B casks) with appropriately rated wire or synthetic slings. The generator must specify if wire or synthetic slings are used as this affects WCS’ offloading rigging configuration.

Rigging and slings must be readily accessible beneath the cask primary lid by staff using extended reach tools while located at the side of cask, below the plane of the cask opening. Do not allow rigging or slings to slide down between the liner and cask or become tangled.

Standard Configuration - Typically liners have a total of (4) four connection points on top for attaching rigging/slings. The preferred configuration of rigging/slings for WCS is to have (2) two separate slings (synthetic or wire) with each end of each sling attached to one of the four liner connection points with a shackle of equal or greater lifting capacity as the sling. The two slings then form a “handle” for the liner similar to a grocery bag. In some instances, the generator may desire to use other configurations of slings / rigging for various reasons, in these instances please contact WCS to discuss the alternative sling / rigging configuration.

TN-RAM Cask and Liners

TN-RAM liners will be offloaded exclusively with WCS’ Irradiated Hardware Transfer System (IHTS) and a TN-RAM grapple. In special arrangement situations discussed and approved with WCS prior to receipt of the cask/liner, WCS may manually hook up an alternative rigging method to the IHTS that does not involve the grapple. In order to fit in the MCC for disposal at the FWF, the TN-RAM liner must not exceed an overall height of 107 inches and 34 inches in diameter.



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Other Configurations in Shielded Shipping Casks

Please contact WCS during waste profiling to discuss other cask shipment configurations.

Type B Cask Authorized User Information

WCS is an NRC authorized user of the 8-120B (certificate of compliance 9168), 10-160B (certificate of compliance 9204), RT-100 (certificate of compliance 9365), and TN-RAM (certificate of compliance 9233) casks.

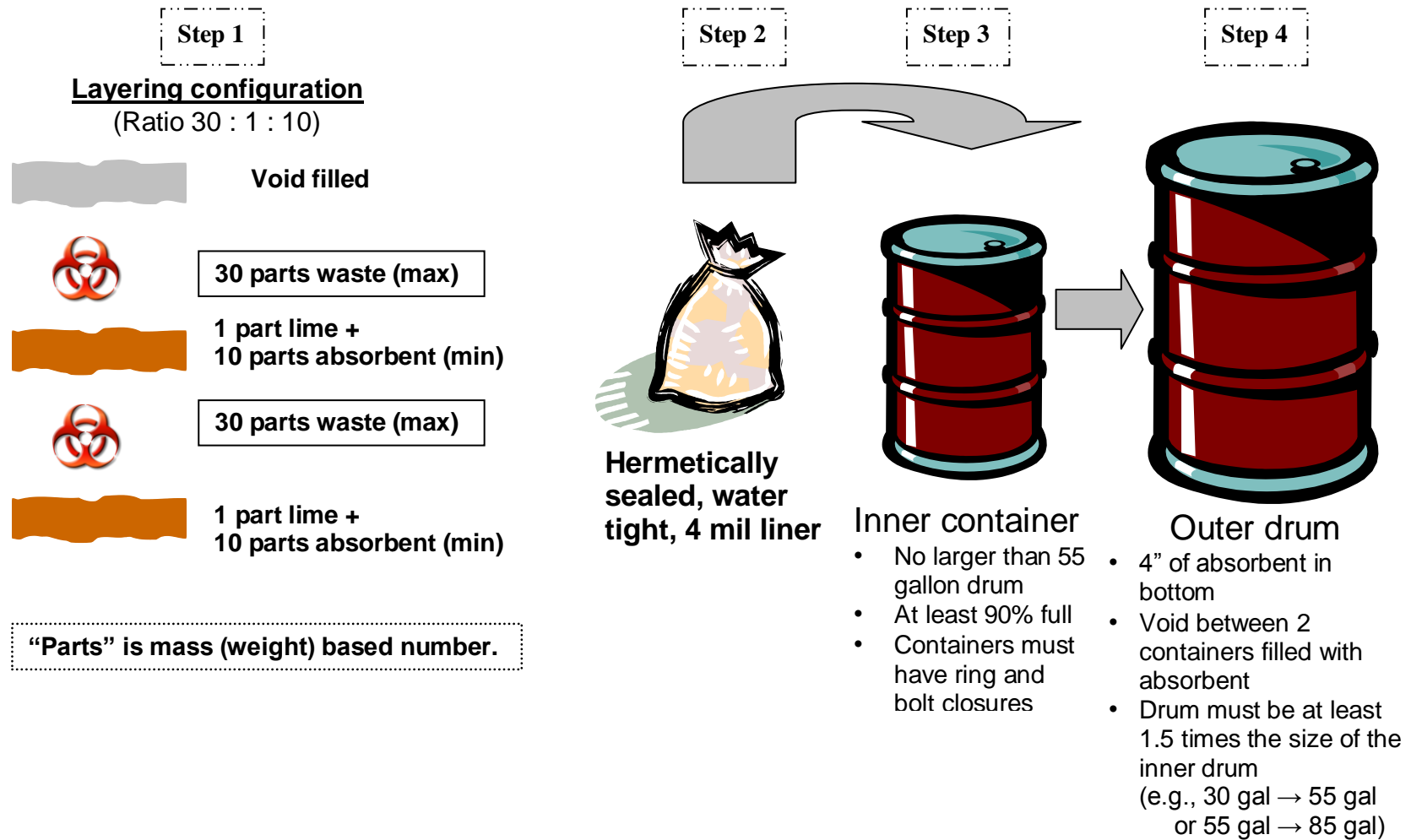
WCS is registered in writing with the DOE Certifying Official per DOE Order 460.1C for use of the 8-120B (NRC certificate of compliance 9168 with DOE as the Registered User) 10-160B (NRC certificate of compliance 9204 with DOE as the Registered User) and TN-RAM (NRC certificate of compliance 9233 with DOE as the Registered User) casks.

WCS is registered in writing with the DOE Certifying Official per DOE Order 460.1C for use of the 10-160B (DOE certificate of compliance 9204).

WCS will become an authorized user of other Type B casks upon request. Type A casks do not require prior user authorization by NRC or DOE.

APPENDIX 5 – HAZARDOUS, BIOLOGICAL, PATHOGENIC, OR INFECTIOUS WASTE PACKAGING

NOTE: The potential hazard from non-radiological material must be treated to reduce the hazard to the maximum extent practicable before packaging





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Appendix 6 – NRC Form and UHWM Examples

FORM 540 UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST SHIPPING PAPER		Waste Control Specialists LLC		5. SHIPPER -- NAME AND FACILITY		SHIPPER ID NUMBER Generator Certification		7. FORM 540 AND 540A FORM 541 AND 541A FORM 542 AND 542A ADDITIONAL INFORMATION		PAGE OF PAGE(S)		8. MANIFEST NUMBER (SEE THE BOTTOM OF ALL CONTINUATION PAGES)	
1. EMERGENCY TELEPHONE NUMBER (Include Area Code)		WXXXX		SHIPMENT NUMBER SR-XXXX-XXXX		COLLECTOR <input type="checkbox"/>		9. CONSIGNEE - Name and Facility Waste Control Specialists LLC Federal Waste Disposal Facility 9998 W. State Hwy 176 Andrews, TX 79714		CONTACT Susan Van Leuvan TELEPHONE (432) 525-8500			
2. IS THIS AN EXCLUSIVE USE SHIPMENT? <input type="checkbox"/> YES <input type="checkbox"/> NO		3. TOTAL PACKAGES ON THIS		CONTACT		PROCESSOR <input type="checkbox"/>							
4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT? If "Yes," provide Manifest Number xxxxxx		EPA ID#				GENERATOR TYPE (Specify)							
11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (including proper shipping name, hazard class, UN ID number, and any additional information)		12. DOT LABEL "RADIOACTIVE"		13. TRANSPORT INDEX		14. PHYSICAL AND CHEMICAL FORM		15. RADIOISOTOPES		16. ACTIVITY (Ci)		17. TITLE	
UN2916, Radioactive material, Type B(U) package, 7, Fissile Excepted, RD-Radionuclides, (WP-XXXX)												18. TOTAL WEIGHT OR VOLUME	
												19. IDENTIFICATION NUMBER OF PACKAGE	
FOR CONSIGNEE USE ONLY		<input type="checkbox"/> Record Waste Description Inadequate <input type="checkbox"/> Contamination or Leakage Detected <input type="checkbox"/> Unexpected Exposure Rates Detected <input type="checkbox"/> Labels, Markings, etc. Inadequate <input type="checkbox"/> Container Integrity Inadequate <input type="checkbox"/> Other <input type="checkbox"/> No Violations Detected on this Shipment		20.									

Optional - Enter DSHS Shipper Registration Number

Optional - Enter ELITE Shipment Number

Enter Shipper's 9 character Generator Certification Number assigned by WCS

Enter Consignee Data as Shown

Enter Waste Profile Number after Proper Shipping Name

The manifest number is typically assigned by the generator



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FORM 542 UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST			Waste Control Specialists LLC		1. WASTE COLLECTOR/PROCESSOR					2. MANIFEST NUMBER			
<small>MANIFEST INDEX AND REGIONAL COMPACT TABULATION</small>					NAME								
<small>List all original "PROCESSED WASTE" generators (if any) before "COLLECTED WASTE" generators.</small>					IDENTIFICATION NUMBER <i>Generator Certification Number</i>								
					SHIPPING DATE					3. PAGE OF PAGE(S)			
4. GENERATOR IDENTIFICATION NUMBER	5. GENERATOR NAME AND TELEPHONE NUMBER	6. GENERATOR FACILITY ADDRESS	6A. WASTE DESCRIPTION (NOMENCLATURE)	7. PREPROCESSED WASTE (OR MATERIAL) VOLUME (m3) (13)	8. MANIFEST NUMBER(S) UNDER WHICH WASTE (OR MATERIAL) RECEIVED AND DATE OF RECEIPT	9. WASTE CODE P = PROCESSED C = COLLECTED	10. ORIG COI RE OR	AS PROCESSED/COLLECTED TOTAL				11. F. MAXIMUM RADIATION LEVEL (mrem/yr)	
TOTALS OF ALL PAGES (FORMS 542 AND 542A)													

Enter 9 character
Generator
Certification
Number assigned
by WCS



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DOE/NRC FORM 741 <small>(6-2011) Previous editions are obsolete MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 93-703, 93-438, 95-91</small>		U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0003 <small>Estimated burden per response to comply with this mandatory collection request: 1 hour and 15 minutes. This information is required for IAEA accounting reports that show changes in inventory of nuclear materials. Send comments regarding burden estimate to the Information Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE03-10202, (3150-0003), 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.</small>			EXPIRES: 05/31/2014													
NUCLEAR MATERIAL TRANSACTION REPORT																					
1 SHIPPER'S R/S		2 RECEIVER'S R/S		3 TRANSACTION NO		4 CORRECTION NO		5 PROCESSING CODE		6 ACTION CODE		7 DOCUMENTATION (Only if document is classified SECRET)									
VAD																					
8 a NAME AND ADDRESS OF SHIPPER		9 LICENSE NO		10 NAME AND ADDRESS OF RECEIVER		11 LICENSE NO		12 a NO OF DATALINES		13 a SHIPPED FOR ACCOUNT OF		14 b R/S		15 b R/S		16 NO DISTRIBUTION OF COPIES					
		R04100		Waste Control Specialists LLC Federal Waste Disposal Facility 9998 W. State Hwy 176 Andrews, TX 79714 ATTENTION: Lisa Berta TELEPHONE: (432) 525-8500										1		VAD					
17 ATTENTION:		18 TELEPHONE:		19 TRANSFER AUTHORITY - CONTRACT, NM DRAFT, OR ORDER NUMBER		20 EXPORT OR IMPORT TRANSFER LICENSE NO		21 MATERIAL TYPE		22 OBLIGATED ISOTOPE WEIGHT		23 ACTION DATE		24 MONTH (MM)		25 DAY (DD)		26 YEAR (YYYY)			
23a MISCELLANEOUS		23b NOTE ATTACHED		23c UNREPORTABLE		24 TOTAL GROSS WEIGHT		25 TOTAL VOLUME (Nuclear Transfer Only)		26 SHIPPER'S CORRECTION		27 RECEIVER'S CORRECTION		28 RECEIPT		29 RECEIVER'S MEASUREMENT		30 RECEIVER'S CORRECTION			
Enter 540/UHWM Manifest Number(s)						Enter 541 gross weight in whole kg		Enter 541 volume in whole cf													
26. SHIPPER'S DATA		BACK REFERENCE NUMBER	LINE NO	TYPE OF INV CHANGE	IDENTIFICATION (ITEM/BATCH NAME)	NO OF ITEMS	PROJECT NUMBER	MATERIAL TYPE	COURT FACILITY CODE	OWNER CODE	KEY MEAS POINT	MEAS UNIT	GROSS WEIGHT	NET WEIGHT	ELEMENT WEIGHT	ELEMENT LIMIT OF ERROR	WEIGHT % ISOTOPE	ISOTOPE WEIGHT	ISOTOPE LIMIT OF ERROR		
		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r		
26s. SHIPPER'S DATA		SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED										27s. RECEIVER'S DATA		SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED							
27. RECEIVER'S DATA																					
WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.																					



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GENERATOR	UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number	
	5. Generator's Name and Mailing Address		Generator's Site Address (if different than mailing address)			
	Generator's Phone:					
	6. Transporter 1 Company Name			U.S. EPA ID Number		
	7. Transporter 2 Company Name			U.S. EPA ID Number		
	8. Designated Facility Name and Site Address Waste Control Specialists LLC Federal Waste Disposal Facility 9998 W. State Hwy 176 Andrews, TX 79714 Facility's Phone: (432) 525-8500			U.S. EPA ID Number TXR000075788		
	9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number)		10. Containers		11. Total Quantity
				No.	Type	12. Unit Wt./Vol.
						13. Waste Codes
						XXXX XXXX
TRANSPORTER INT'L	14. Special Handling Instructions and Additional Information WP-XXXX ERG #xxx					
	15. Special Handling Instructions and Additional Information Fully and accurately describe the international movement of Consignment or (b) (if I at re					
	16. Port of entry/exit: _____ Date leaving U.S.: _____					
	17. Transporter Acknowledgment of Receipt of Materials					
	Transporter 1 Printed/Typed Name			Signature		Month Day Year
	Transporter 2 Printed/Typed Name			Signature		Month Day Year
	18. Discrepancy					
	18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
	Manifest Reference Number: _____					
	DESIGNATED FACILITY	18b. Alternate Facility (or Generator)			U.S. EPA ID Number	
Facility's Phone: _____						
18c. Signature of Alternate Facility (or Generator)			Month Day Year			
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
1.		2.	3.	4.		
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						
Printed/Typed Name			Signature		Month Day Year	

Enter Designated Facility data as shown

Enter Weights or Volumes corresponding to NRC Form 541

If space is available, enter Texas' 8-character waste code in two adjacent blocks in addition to EPA waste codes

Enter Waste Profile Number(s). Also enter equipment numbers for rail shipments and roll off bins



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APPENDIX 7 – WASTE VERIFICATION REQUIREMENTS

	Bulk Soil	Bulk Debris	Containerized Soil	Containerized Debris	High Dose Rate	Cask Waste
Pre-shipment sample	Required	N/A	Required	N/A	N/A	N/A
Intrusive Visual Inspection	100%	100%	10% of containers from each profiled waste stream per shipment	10% of containers from each profiled waste stream per shipment	N/A	N/A
Intrusive sampling/analysis	For each profiled waste stream: The first 10 shipments, and 10% thereafter	N/A	10% of containers from each profiled waste stream per shipment	N/A	N/A	N/A
External Radiologic Analysis	N/A	10%	N/A	10% of containers from each profiled waste stream per shipment	10% of containers from each profiled waste stream per shipment	100%



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REFERENCES

10 CFR §20.1003, *Definitions*.

10 CFR §61, *Licensing Requirements For Land Disposal Of Radioactive Waste*.

49 CFR, *Transportation*.

30 TAC §25.6, *Conditions Under Which the Commission May Accept Analytical Data*,
[http://info.sos.state.tx.us/pls/pub/readtac\\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=25&rl=6](http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=25&rl=6)

30 TAC §336.229, *Prohibition of Dilution*,
[http://info.sos.state.tx.us/pls/pub/readtac\\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=229](http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=229)

30 TAC §336.362, Appendix E, *Classification and Characteristics of Low-Level Radioactive Waste*,
[http://info.sos.state.tx.us/pls/pub/readtac\\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=362](http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=362)

30 TAC §336.745, *Incidental Commingling of Waste*.
[http://info.sos.state.tx.us/pls/pub/readtac\\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=745](http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=336&rl=745)

DOE Order 460.1C, *Packaging and Transportation Safety*,
<https://www.directives.doe.gov/directives/0460.1-BOrder-c/view>

DSHS Regulatory Guide 2.19, *Guide for Submission of Documents and Fees by Low Level Radioactive Waste Shippers and Transporters*,
<http://www.dshs.state.tx.us/radiation/regguide.shtm>

NRC, 1983, *Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification*, <http://pbadupws.nrc.gov/docs/ML0336/ML033630755.pdf>

NRC, 1983, *Technical Position on Waste Form*, from *Final Waste Classification and Waste Form Technical Position Papers*, <http://pbadupws.nrc.gov/docs/ML0336/ML033630755.pdf>
(*Waste Form* starts on page 16 of 27)

NRC, 2015, *Concentration Averaging and Encapsulation Branch Technical Position, Revision 1*,
<http://pbadupws.nrc.gov/docs/ML1225/ML12254B065.pdf>

NRC Form 540, *Uniform Low-Level Radioactive Waste Manifest - Shipping Paper*. PDF form for data entry at <http://www.nrc.gov/reading-rm/doc-collections/forms/nrc540.pdf> and <http://www.nrc.gov/reading-rm/doc-collections/forms/nrc540a.pdf>

NRC Form 541, *Uniform Low-Level Radioactive Waste Manifest - Container and Waste Description*. PDF form for data entry at <http://www.nrc.gov/reading-rm/doc-collections/forms/nrc541.pdf> and <http://www.nrc.gov/reading-rm/doc-collections/forms/nrc541a.pdf>

NRC Form 542, *Uniform Low-Level Radioactive Waste Manifest - Manifest Index and Regional Compact Tabulation*. PDF form for data entry at <http://www.nrc.gov/reading-rm/doc-collections/forms/nrc542.pdf> and <http://www.nrc.gov/reading-rm/doc-collections/forms/nrc542a.pdf>



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NRC Form 741, *Nuclear Material Transaction Report*. PDF form for data entry at
<http://www.nrc.gov/reading-rm/doc-collections/forms/nrc741.pdf>

NUREG/BR-0006, *Instructions for Completing Nuclear Material Transaction Reports*
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0006/>

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TCEQ, *List of Laboratories Accredited by the State of Texas under the National Environmental Laboratory Accreditation Program (NELAP)*.
www.tceq.state.tx.us/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf.

Texas Health and Safety Code §401.2051, *Conveyance of Waste*,
<http://www.statutes.legis.state.tx.us/Docs/HS/htm/HS.401.htm>

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