
EnergySolutions Clive, Utah

Bulk Waste Disposal and Treatment Facilities

Waste Acceptance Criteria

Revision 11

(Includes Class A LLRW, Mixed Waste, and 11e.(2) Disposal Embankments)



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SECTION 1

INTRODUCTION

1.1 PURPOSE

EnergySolutions has developed this Bulk Waste Disposal and Treatment Facilities – Waste Acceptance Criteria (BWF WAC) document to assist waste generators and their contractors by providing information about the capabilities and requirements of the EnergySolutions’ Clive, Utah disposal and treatment facilities (Clive Facility). The Clive Facility is authorized to receive and dispose of the following:

- Class A Low-Level Radioactive Waste (LLRW)
- NORM/NARM
- Class A Mixed LLRW (i.e., radioactive and hazardous)
- 11e.(2) Byproduct Material
- Asbestos-Containing Material (ACM),
- PCB Radioactive, and
- Other various forms and types of radioactive waste.

The BWF WAC provides information on the Clive Facility waste acceptance processes including:

- Waste characterization and profiling,
- Pre-shipment sampling and analysis,
- Waste packaging, transportation and delivery,
- Waste receipt, verification sampling and acceptance, and
- Waste treatment and disposal.

These waste acceptance criteria collectively pertain to the Bulk Waste and Treatment Facilities which are described in detail below. EnergySolutions online Customer Portal website allows users to enter all waste profiling information, schedule requests for shipments, and validate uploaded electronic manifests. The BWF WAC does not apply to EnergySolutions’ Containerized Waste Facility (CWF) at Clive. Generators requiring CWF disposal should refer to the CWF WAC, which can be downloaded from the Customer Portal at EnergySolutions’ website at www.energysolutions.com.

EnergySolutions has also created a WAC Technical Support Document that accompanies and augments both the BWF and CWF WAC documents. The WAC Technical Support Document provides additional background information and sample calculations to aid customers in support of the BWF and CWF WACs. This document will be referred to throughout this BWF WAC wherever it may be applicable. In addition to supporting technical information, the WAC Technical Support Document contains a list of acronyms used in this BWF WAC.

1.2 SCOPE

Numerous state and federal agencies regulate the management, transportation, treatment and disposal of radioactive and hazardous materials. This document provides guidance on the Clive Facility waste acceptance process and should be used in conjunction with current copies of the Clive Facility licenses, permits and applicable state and federal regulations. These licenses, permits, and regulations take precedence over any information contained in this document. Generators may request variances from the

BWF WAC on a case-by-case basis. *EnergySolutions* will evaluate such requests and provide written notification to the generator if the variance is approved. In some cases, a variance may require state or federal regulatory approval.

Links to the Clive Facility governing licenses and permits may be found at the Customer Portal on the *EnergySolutions*' website at www.energysolutions.com. In addition, Appendix A of this BWF WAC contains a list of contact information for both *EnergySolutions* and the State of Utah. The *EnergySolutions* Clive Facility Technical Services staff includes:

Tim Orton	Director of Technical Services
Jake Gardner	VP of Technical Services
Veronica Pitts	Technical Services Customer Specialist

Technical Services staff are available to answer any questions and can be contacted using the phone numbers/emails listed in Appendix A.

1.3 RESPONSIBILITIES

The generator is responsible to characterize, classify, schedule, manifest, package and transport waste shipments to the Clive Facility in accordance with this BWF WAC, licenses, permits, and applicable state and federal regulations. For waste classification, generators must have in place a quality control program to ensure compliance with the waste classification requirements within the Utah Administrative Code. The generator or authorized representative must complete and submit a Radioactive Waste Profile Record through the *EnergySolutions* Customer Portal for review and approval prior to shipment. Additional forms and certifications may also be required such as the Special Nuclear Material Exemption Certification, the PCB Waste Certification, and the Land Disposal Restriction Notification and/or Certification. Section 4 of this BWF WAC details the waste profiling process. The generator or authorized representative should be available to resolve issues that arise associated with waste shipments.

The Clive Facility is responsible to safely and compliantly receive, treat (if applicable), and dispose of waste shipments in accordance with all applicable permits, licenses, and regulations. *EnergySolutions* will provide disposal and/or treatment certificates upon request from the generator. In addition, *EnergySolutions* will contact the generator to resolve non-conforming waste shipments or discrepancies with the contractual terms and conditions associated with the receipt and management of waste shipments.

SECTION 2

SITE AND FACILITY DESCRIPTION

2.1 LICENSES, PERMITS, AND AUTHORIZATION

The Clive Facility is permitted, licensed, and authorized to receive, treat, and dispose of Class A LLRW, NORM/NARM (including TENORM), Class A Mixed LLRW, 11e.(2) Byproduct Material, Special Nuclear Material based on concentration limits, Polychlorinated Biphenyls (PCB) Radioactive Waste, and PCB Mixed Waste in accordance with the following documents. These documents are available for viewing on the EnergySolutions Customer Portal at www.energysolutions.com.

- Radioactive Material License (RML) Number UT 2300249, as amended
 - Class A LLRW as defined in Utah Administrative Code R313-15-1009
 - Class A Mixed LLRW (radioactive and hazardous)
 - NORM/NARM
 - Special Nuclear Material (concentration-based limits approved in the SNM Exemption Order)
- 11e.(2) Byproduct Material License Number UT 2300478, as amended
 - 11e.(2) Byproduct Material as defined by the Atomic Energy Act, as amended
- State-issued Part B Permit (EPA ID Number UTD982598898), as amended
 - Storage, treatment, and disposal of Mixed Waste
 - Authorizes disposal of specific types of PCB regulated waste in the LLRW and Mixed Waste disposal facility, depending upon the type and concentration of PCBs present in the waste (as allowed by regulation and Toxic Substance Control Act, TSCA, Approvals)
- Special Nuclear Material (SNM) Exemption Order issued by the Nuclear Regulatory Commission (NRC), as amended
 - Authorizes receipt, storage, treatment, and disposal of waste containing SNM based on concentration limits rather than mass limits
- TSCA Coordinated Approval and TSCA Shredding Approval issued by EPA Region 8, as amended
 - Authorizes the receipt, management, and disposal of PCB Radioactive and PCB Mixed Waste (40 CFR Part 761)

Section 3 of this BWF WAC details the various waste types and waste forms that are acceptable at the Clive Facility. Waste streams that are subject to multiple regulations must meet the requirements for each applicable regulation.

2.2 SITE LOCATION AND ACCESS

Clive Facility operations are conducted on and adjacent to Section 32, Township 1 South, Range 11 West, SLM, Tooele County, Utah. The facility is about 75 miles west of Salt Lake City and about three miles south of Interstate 80, Exit 49. The site is conveniently accessed by both highway and rail transportation.

The disposal site mailing address (for FedEx shipments only) is:

EnergySolutions LLC
Clive Disposal Site
2235 South Salt Bush Road
Grantsville, UT 84029
Phone: (801) 649-2175

Regular mail can be sent to:

EnergySolutions LLC
Attention: Clive Disposal Facility
299 South Main Street, Suite 1700
Salt Lake City, UT 84111

Waste shipment manifests (see Section 5 of this BWF WAC) should use the following address for the Consignee:

EnergySolutions LLC
Clive Disposal Site (Bulk Waste Facility)
Interstate 80, Exit 49
Clive, UT 84029

The Clive Facility receives waste shipped via bulk truck, containerized truck, enclosed truck, tanker trailer, bulk railcars, rail boxcars, and rail intermodals. The transportation access allows the Clive Facility to operate throughout the entire year. The disposal site is accessed by the Union Pacific Railroad at EnergySolutions' private rail siding. The Clive Facility uses more than 16 miles of track and two locomotives for railcar management. The covered railcar thaw shed, rotary dumpers, and railcar decontamination facilities allow for the efficient unloading, decontamination and return of rail shipments.

2.3 DISPOSAL AND TREATMENT FACILITIES

The design and operation of the Clive Facility site provides a long-term disposal solution with a minimal need for active maintenance after closure. The Clive Facility disposes of waste in above-ground engineered disposal cells (embankments). The design of these cells is patterned after DOE and EPA specifications for the VITRO disposal embankment. Each licensed disposal embankment meets or exceeds the applicable regulatory requirements.

Figure 2-1 shows the locations of the Clive Facility waste treatment, disposal, and operations areas. Clive waste operations are managed as three facilities:

- “Bulk Waste Facility” (BWF) – including Mixed Waste, LARW, 11e.(2) and Class A LLRW
 - The BWF also includes the Large Component (LC) disposal area within the Class A LLRW footprint
- “Containerized Waste Facility” (CWF) – located within the Class A LLRW footprint
- “Treatment Facility” (TF) – located in the southeast corner of the Mixed Waste area

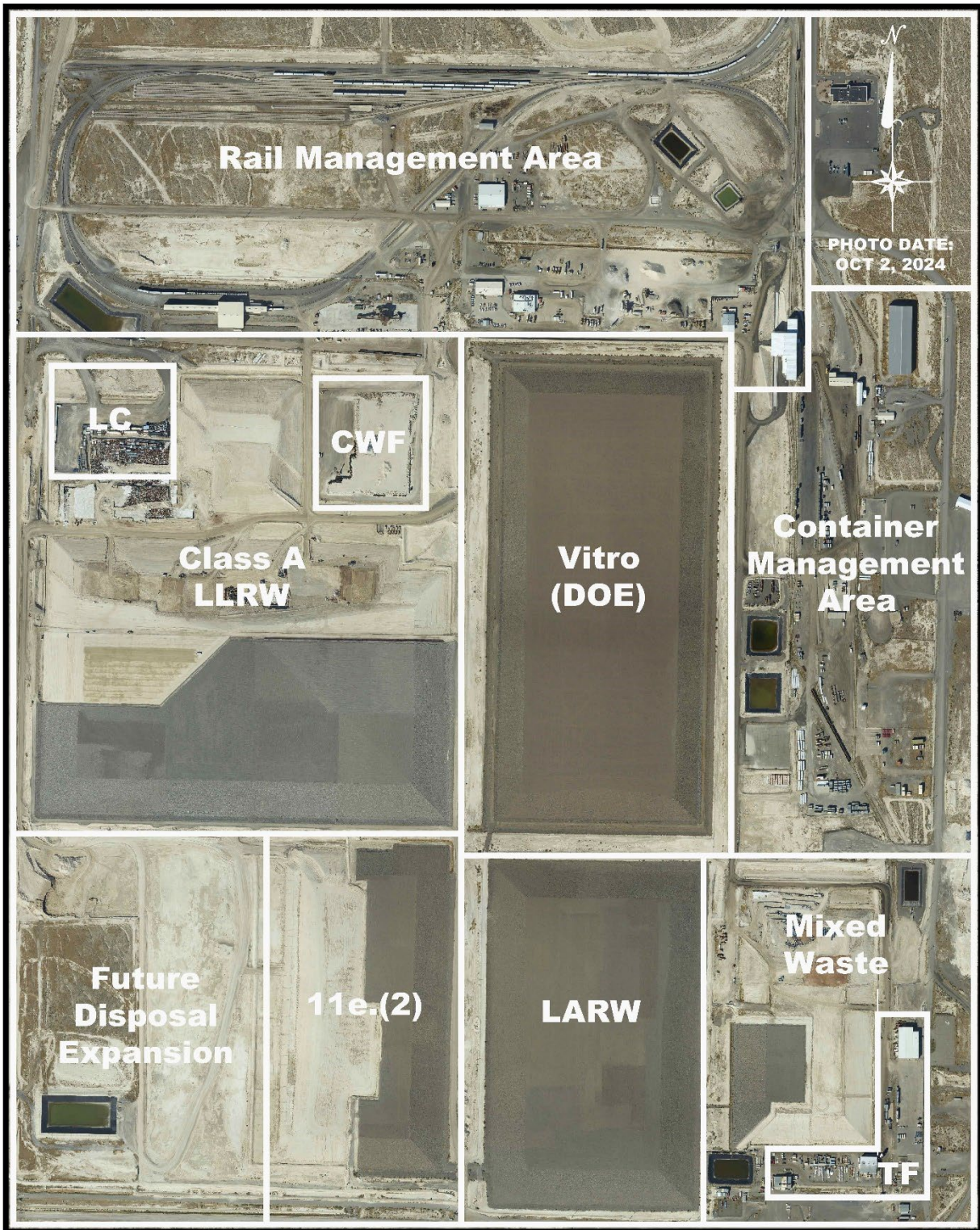


Figure 2-1. Clive Facility Disposal and Treatment Facilities

The Rail Management Area (or Clive Rail Facility, CRF) north of the Class A LLRW embankment allows storage of railcars that have not been radiologically released awaiting deployment to customer sites. The area also may be used to transload closed containers of radioactive waste. This area is in a radiologically controlled area outside of the radioactive restricted area.

2.3.1 Bulk Waste Facility

Waste shipped for direct disposal that is compliant with the ALARA Criteria described below is managed at the Bulk Waste Facility (BWF). Such waste is either removed from the container or filled with a grout-like mixture to minimize void spaces. Waste that is removed from the shipping container is typically compacted into soil lifts. For disposal in a bulk soil lift, debris must be less than 10 inches in at least one dimension and no longer than 12 feet in any dimension. Debris items that exceed this size limit are disposed of using a cementitious grout in a different disposal area within the BWF. Large components (described in section 3.2.3.3 of this BWF WAC) are placed in a specific radiologically non-contaminated area of the LLRW embankment (location “LC” in Figure 2-1). Waste is directly disposed at the Class A LLRW, Mixed Waste, or 11e.(2) disposal embankments. Bulk containers (e.g., intermodals, gondolas, etc.) and non-bulk containers (e.g., drums, boxes, etc.) are acceptable for receipt at the BWF.

Unlike the CWF, there are no void filling requirements for waste received at the BWF. Due to equipment and safety concerns, *EnergySolutions* strongly requests that waste in drums and/or bags be placed on pallets within the shipping conveyance.

The BWF includes the following disposal embankments and structures:

- Class A LLRW and NORM disposal embankment
- 11e.(2) Byproduct Material disposal embankment
- Mixed Waste disposal embankment for LDR compliant solid waste
- Intermodal unloading facility for unloading and staging bulk waste shipments for disposal
- Railcar Rotary Dump facilities (2) for unloading bulk waste rail shipments for disposal
- Rail Wash Facility for decontamination, surveying, and releasing of railcars
- Container Wash Facility for decontamination, surveying and releasing of bulk containers

2.3.2 Containerized Waste Facility

Waste shipped for direct disposal exceeding the Clive Facility ALARA Criteria is managed at the Containerized Waste Facility (CWF). Waste must be packaged in disposal containers (e.g., drums, boxes, liners, etc.) instead of bulk containers (e.g., intermodals, gondolas, etc.) for shipments to the CWF since *EnergySolutions* will not remove such waste from its container due to the elevated dose rates. Please refer to *EnergySolutions*’ CWF WAC for information on shipping waste to the CWF.

2.3.3 Treatment Facility

Waste shipped to *EnergySolutions* for treatment or liquid solidification/verification prior to disposal is managed at the Clive Treatment Facility. The Treatment Facility is located within the Mixed Waste Facility and is shown in Figure 2-1 as “TF”. The Treatment Facility is designed for radioactive waste that requires treatment for Resource Conservation and Recovery Act (RCRA) constituents and for liquid

radioactive wastes requiring solidification prior to disposal. The Clive Facility Mixed Waste treatment and solidification capabilities include:

- Chemical Stabilization – Including oxidation, reduction, neutralization and deactivation.
- Amalgamation – For the treatment of elemental mercury (including stabilization for final disposal – the state of Utah requires elemental mercury be amalgamated and meet a specific treatment standard prior to disposal)
- Macroencapsulation – For the treatment of radioactive lead solids, RCRA metal-containing batteries and hazardous debris.
- Liquid Solidification – For the solidification of radioactively contaminated liquids such as aqueous solutions, oils, antifreeze, etc. to facilitate land disposal. Mixed waste liquids can also be treated and solidified at the Treatment Facility.
- Vacuum Thermal Desorption (VTD) of Organic Constituents - For the thermal segregation of organic constituents from wastes including wastes with PCBs. Waste containing PCB liquids is also acceptable for VTD treatment. Liquids will require solidification prior to processing through the system (the Clive Mixed Waste facility will perform this solidification as part of the treatment process). The organic liquid condensate generated in the VTD process must be treated prior to final disposal. The non-liquid waste residue will be further treated for metal contaminants (if required) and disposed in the Mixed Waste embankment.
- Sorting and Segregation (sort & seg) – For comingled waste that may require different treatment options depending upon the physical or chemical make-up of the waste (e.g., a single container may be primarily debris for macroencapsulation but may have some oils present that will require VTD treatment). The sort & seg process may also sort out Mixed Waste for treatment/disposal from LLRW that can then be disposed in the LLRW embankment. Since this type of sort & seg requires additional resources at the Clive Facility, it will require prior approval from Technical Services before shipping to Clive.

The Treatment Facility includes open and covered waste storage areas for storing, sampling, and staging both solid and liquid Mixed Waste shipments.

2.4 ALARA CRITERIA FOR THE BULK WASTE AND TREATMENT FACILITIES

The Clive Facility has implemented an “As Low As Reasonably Achievable” (ALARA) Criteria to minimize worker exposures. The ALARA Criteria is not a license condition but is used as the primary distinction between waste that is acceptable for direct disposal at the BWF and CWF. Wastes with higher dose rates exceeding the ALARA Criteria are disposed at the CWF where waste packages are directly disposed without sampling and actual waste handling. Conversely, wastes with dose rates less than the ALARA Criteria may be disposed at the BWF since the waste is sampled and, in most cases, removed from the shipping container.

As shown in Table 2-1, these ALARA Criteria define allowable external contact dose rates and loose surface contamination limits for waste managed at the BWF. If the values in Table 2-1 are exceeded, the waste should be managed as CWF waste; however, a case-by-case evaluation may be made for BWF disposal.

Table 2-1. Clive ALARA Criteria

External Contact Dose Rate	Removable Surface Contamination On Exterior Surfaces of Debris
< 200 mR/hr on manifested container	< 500 dpm α /100 cm ²
< 500 mR/hr on external, accessible surfaces of waste in container	< 50,000 dpm β,γ /100 cm ²
< 80 mR/hr on contact of an unshielded container with resin	

2.4.1 External Contact Dose Rate Limits

The external contact dose rate limit of 200 mR/hr applies to the manifested container (e.g., drums/boxes on a flatbed truck or enclosed van, bulk containers such as intermodals, sealands, cargo containers, etc.). For example, if drums or boxes are shipped in a bulk container, such as an intermodal, and the intermodal is manifested as the strong, tight container, then the external contact dose rate of 200 mR/hr applies to the intermodal and not to the drums or boxes inside the intermodal. The drums and boxes in this case would be considered waste and must not contain any item with dose rates exceeding 500 mR/hr on the external, accessible surfaces of the item.

The dose rate for debris items such as pipes should only be measured on the exterior surfaces and on the plane surface of the opening of the pipe to demonstrate compliance with the ALARA Criteria.

2.4.2 Resin External Contact Dose Rate Limits

Unless approved in writing by *EnergySolutions*, resins must be shipped in disposal containers such as drums, boxes, liners, etc. to the BWF for grouting if the container is compliant with the ALARA Criteria. Resins shipped to the BWF must be shipped under a Waste Profile specific for resins unless specifically approved in writing by *EnergySolutions*. Resins with dose rates that exceed these limits must be disposed of at the CWF.

2.4.3 Removable Surface Contamination Limits

The same ALARA principles apply to the removable surface contamination limits. The main concern is controlling loose contamination on the exterior surfaces of debris items removed from the container. Fixatives may be applied to the debris items to reduce the removable contamination levels below the specified limits.

2.4.4 Requests for Exceptions

Requested exceptions to the ALARA Criteria are evaluated on a case-by-case basis. Requests are to be made through the SWSA process described in Section 4.7 of this BWF WAC. Generators must provide radiation and contamination surveys of the container and/or waste item when requesting approval to exceed the ALARA Criteria. Dose rate measurements at one foot from the waste should be provided on the radiation survey. The transportation mode and manifested package information should also be included with the request. The generator must receive written approval for exceptions to the ALARA Criteria prior to shipment of the waste.

SECTION 3

WASTE CRITERIA

3.1 ACCEPTABLE RADIOACTIVE WASTES

The type, form, and quantity of LLRW, NORM, 11e.(2) byproduct material, and mixed waste that the Clive Facility can receive for treatment and disposal is governed by the various licenses and permits under which the Clive Facility operates. The Clive Facility has been issued an Agreement State Radioactive Material License (License #UT 2300249, as amended) by the Utah Division of Waste Management and Radiation Control (DWMRC). This license authorizes the Clive Facility to receive Class A LLRW, NORM, and NARM waste. The Clive Facility has been issued a separate license (License number UT 2300478, as amended) to receive and dispose of uranium and thorium mill tailings byproduct material as defined by section 11e.(2) of the Atomic Energy Act of 1954, as amended.

The DWMRC issued the Clive Facility a State-issued Part B Permit (EPA ID Number UTD982598898) to treat and dispose of hazardous waste which is also contaminated with LLRW, NORM, or NARM wastes (mixed waste). The Clive mixed waste facility has a TSCA Coordinated Approval from the EPA to receive all types of PCB waste.

The Clive Facility also has a Compliance Agreement with the United States Department of Agriculture (USDA) that allows the facility to receive quarantine waste from different parts of the country. Contact a Technical Services representative prior to shipping soil or soil-like waste that may contain waste quarantined by the USDA.

3.1.1 Class A Low-Level Radioactive Waste

The Clive Facility is authorized to receive Class A Low-Level and Mixed Low-Level Radioactive Waste. These wastes must be classified in accordance with the requirements of Utah Administrative Code (UAC) R313-15-1009, Classification and Characteristics of Low-Level Radioactive Waste. Utah rule R313-15-1009 is similar to the NRC Waste Classification requirements in 10 CFR 61.55, with the addition of Radium-226 at 100 nCi/g in Table 1. As required in 10 CFR 20, Appendix G, generators must have in place a quality control program to ensure compliance with the waste classification requirements and prepare and retain with manifest documentation a record documenting the generator's waste classification analysis. Shippers and generators should also review NRC IE Bulletin No. 79-19 to ensure compliance with applicable training requirements in managing LLRW.

For further instructions and examples of waste classification, please see the WAC Technical Support Document.

3.1.1.1 NRC Branch Technical Position on Concentration Averaging

Waste classification for shipments to the Clive Facility may utilize the NRC's "Concentration Averaging and Encapsulation Branch Technical Position", as amended (BTP). Utilization of the BTP for purposes of waste classification concentration averaging requires approval from EnergySolutions. Generators must provide the information described in EnergySolutions Technical Basis Document # 17-001 which can be found in the WAC Technical Support Document. The form in 17-001 is not required; however, the information must be provided during profiling or prior to any shipment with waste that has been averaged using the BTP. Contact Technical Services for assistance.

3.1.1.2 Waste Classification Labels on Packages

All waste packages containing LLRW, including Mixed LLRW, must be labeled either “Class A Unstable” or “Class AU” and appropriately marked in Block 17 of the Uniform Low-Level Radioactive Waste Manifest Form 541. There are no Federal regulations that prescribe the size or color of the classification labels. **The Utah DWMRC, however, requires that each package be labeled with a minimum of 0.5-inch lettering in contrasting color.** This requirement also applies to bulk packaging (e.g., intermodals, gondolas, etc.).

3.1.1.3 LLRW Compact Export Approval

The Clive Facility is not classified as an LLRW compact site under the Federal Low-Level Radioactive Waste Policy Act, as amended. The Clive Facility RML requires generators to demonstrate that the LLRW has been approved for export to the facility prior to the initial shipment of waste. In cases where an initial export authorization comes with an expiration date, generators are responsible for ensuring export authorization prior to shipment. Approval is required from the LLRW compact of origin, or for states unaffiliated, the state of origin. **All waste shipments received at Clive that require compact export authorization must include a copy of the authorization letter included with the shipping documentation.** This license condition only applies to non-DOE/DOD generators of LLRW and excludes Mixed LLRW and NORM/NARM (see Section 3.1.2 of this BWF WAC) for all compacts except the Rocky Mountain Compact (the Rocky Mountain Compact requires approval for LLRW, NORM/NARM, and Mixed Waste shipped to the Clive Facility). In addition, the Clive Facility is not authorized to receive LLRW from the Northwest Compact, unless specific approval has been granted by the Northwest Compact. Please contact a Technical Services representative for assistance in complying with this license condition.

Waste collectors and waste processors are required to submit NRC Form 542 with each shipment. If waste from multiple generators has been blended during processing (e.g., incineration), the waste must have attribution sheet(s) accompanying the shipment to properly document the generators, and states, to which the waste should be attributed. Any export approvals for these states must be included with the shipping paperwork as well.

3.1.2 NORM/NARM Waste

The Clive Facility RML allows receipt and disposal of Naturally Occurring or Accelerator-Produced Radioactive Material (NORM/NARM) and Technologically Enhanced NORM (TENORM). NORM/NARM does not include Byproduct, Source, or Special Nuclear Material and generally contains radionuclides in the uranium and thorium decay series. Since NORM/NARM waste is not considered LLRW, the waste classification regulations do not apply. **LLRW Compact approval is required for NORM/NARM waste exported from the Rocky Mountain Compact.**

3.1.3 Class A Mixed Low-Level Radioactive Waste

The Clive Facility is authorized to receive Class A Mixed Low-Level Radioactive Waste (Mixed Waste) for direct disposal or treatment and disposal. Mixed Waste is defined by the Clive Facility State-issued Part B Permit as:

“Waste defined by the Low Level Radioactive Waste Policy Act, Public Law 96-573; this is radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined by section 11e.(2) of the Atomic Energy Act, and contains hazardous waste that is either listed as a hazardous waste in Subpart D of 40 CFR

261 and/or exhibits any of the hazardous waste characteristics identified in Subpart C of 40 CFR 261, or hazardous waste which also contains naturally occurring radioactive materials.”

In accordance with 40 CFR 268.7, and by requirement of the State-issued Part B Permit, a Land Disposal Restriction (LDR) Notification and/or Certification must accompany each shipment of Mixed Waste. This includes former hazardous wastes that have been treated to remove the Hazardous Waste Codes.

3.1.3.1 Acceptable Hazardous Waste Codes

The specific EPA Hazardous Waste Codes that may be received by The Clive Mixed Waste Facility are identified in Module III of the Clive Facility State-issued Part B Permit. A copy of this permit may be found in the Customer Portal tab on the EnergySolutions' web site at www.energysolutions.com. The following Utah Hazardous Waste Codes are not acceptable at the Clive Facility: F999 and P999. Contact Technical Services if you have a hazardous waste code that does not appear to be acceptable to the Clive Facility.

3.1.3.2 LDR Compliant Mixed Waste

Mixed Waste that is determined to be compliant with the Land Disposal Restriction (LDR) treatment standards specified in 40 CFR 268 may be directly disposed in the Clive Facility Mixed Waste disposal embankment, or under certain circumstances, may be transferred to the LLRW embankment for disposal. Generators are required to provide certification if their waste is LDR Compliant. By permit, EnergySolutions is required to verify LDR compliance for all Mixed Waste streams prior to disposal. This verification includes a visual examination of the waste as well as random sampling.

3.1.3.3 Mixed Waste Requiring Treatment

The Clive Facility may also receive Mixed Waste that requires treatment in order to comply with LDR treatment standards. The Clive Facility is approved under its State-issued Part B Permit to operate a mixed waste treatment facility. Several attachments within the permit describe treatment processes. Mixed Waste that is not LDR compliant may be treated by the Clive Facility using one of the following treatment technologies or methods:

- Chemical Stabilization, Oxidation, Reduction, Neutralization, and Deactivation
- Macroencapsulation of hazardous debris or radioactive lead solids
- Thermal Treatment of Organics including PCBs (VTD)
 - The VTD unit is also approved by EPA to treat waste that is required to be treated using the combustion technology (CMBST)
- Mercury Treatment (Amalgamation, AMLGM)

For further instructions and examples of waste treatment technologies, please see the WAC Technical Support Document.

3.1.4 11e.(2) Byproduct Material

The Clive Facility is licensed by the Utah DWMRC to receive and dispose of 11e.(2) byproduct material as defined by the Atomic Energy Act, as amended. 11e.(2) byproduct material is defined as the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. Shipments of 11e.(2) waste will be managed and disposed of in a separate disposal embankment specifically licensed and designed for this material. All shipments of 11e.(2) waste must be

approved prior to scheduling of the shipment of waste. Please contact a Technical Services representative to obtain approval for an 11e.(2) shipment.

For further instructions on 11e.(2) waste characterization and shipping, please see the WAC Technical Support Document.

3.1.5 Special Nuclear Material (SNM)

The Clive Facility RML incorporates a Special Nuclear Material Exemption issued by the NRC. Under specified conditions, the exemption allows the Clive Facility to possess waste containing SNM in greater mass quantities than prescribed in 10 CFR Part 150 without obtaining an NRC license pursuant to 10 CFR Part 70. The conditions are based on concentration limits of SNM in the waste and have been established by the NRC to ensure criticality safety. Special Nuclear Material (SNM) is defined in UAC R313-12-3 as:

“Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and other material that the U.S. Nuclear Regulatory Commission, pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954, as amended, determines to be Special Nuclear Material, but does not include source material; or any material artificially enriched by any of the foregoing but does not include source material.”

Each generator shipping waste containing SNM (i.e., uranium enriched in U-235, U-233, Pu-236, Pu-238, Pu-239, Pu-240, Pu-241, Pu-242, Pu-243, or Pu-244) must complete and sign *EnergySolutions*' SNM Exemption Certification form as part of the waste profiling process. The SNM Exemption Certification form lists specific requirements that must be met in order for the Clive Facility to receive and accept waste containing any amount of SNM. The information on this form is to be completed using the *EnergySolutions* online Customer Portal at www.energysolutions.com. The current two-page form (Revision 4) is depicted in Figures 3-1 and 3-1a. The enriched uranium concentration must be less than 1,900 pCi/g distributed evenly within each shipment container. This maximum concentration is reduced with higher enrichment and/or the presence of neutron moderators.

A copy of this form must also accompany each radioactive waste manifest for waste streams that contain any of the above isotopes. This form is to be reviewed and signed no earlier than 180 days prior to shipping (legacy forms and profile copies are not acceptable).

For further instructions on filling out the form, and examples of SNM Exemption characterization, please see the WAC Technical Support Document.

SPECIAL NUCLEAR MATERIAL EXEMPTION CERTIFICATION

The Special Nuclear Material Exemption Certification form must be completed and signed by each generator certifying to the following conditions. Please attach this form and all required information to the Radioactive Waste Profile Record (EC-0230). **A completed and signed copy of this form must also accompany each waste manifest.**

Waste Stream ID: _____ Manifest No. _____

1. Check applicable category below for the waste stream:

✓	Uranium Enrichment Percent	Weight Percent of Chemicals in Condition 2c	Weight Percent of Materials in Condition 2d	U-235 Concentration (pCi/g)	Measurement Uncertainty* (pCi/g)
☐	< 10 %	≤ 20 %	≤ 1 %	≤ 1,900	≤ 285
☐	Unlimited	≤ 20 %	≤ 1 %	≤ 1,190	≤ 179
☐	Unlimited	Sum of both ≤ 45 % of waste by weight		≤ 680	≤ 102
☐	Unlimited	Unlimited	Unlimited	≤ 26	≤ 10
☐	Not Applicable - Enriched U-235 is not present in the waste.				

* A concentration value is used for the maximum measurement uncertainty limit rather than a percentage value to allow greater flexibility for generators with waste having very low SNM concentrations.

2. Certify to the following requirements by checking applicable boxes, A-E for solid waste or A-F if waste includes liquid:

- ☐ a. Concentrations of SNM in individual waste containers do not exceed the applicable values listed in the above table and SNM isotope concentrations listed in Table 1.
- ☒ b. The SNM is homogeneously distributed throughout the waste or the SNM concentrations in any contiguous mass of 600 kilograms (1,323 lbs) do not exceed on average the specified limits. (Based on process knowledge or testing).
- ☐ c. Except as allowed by Condition 1, the waste does not contain "pure forms" of chemicals containing carbon, fluorine, magnesium, or bismuth in bulk quantities (e.g., a pallet of drums, a B-25 box). By "pure forms," it is meant that mixtures of the above elements such as magnesium oxide, magnesium carbonate, magnesium fluoride, bismuth oxide, etc. do not contain other elements. (Based on process knowledge or testing).
- ☐ d. Except as allowed by Condition 1, the waste does not contain total quantities of beryllium, hydrogenous material enriched in deuterium, or graphite above one percent of the total weight of the waste. (Based on process knowledge, physical observations, or testing).
- ☐ e. Waste packages do not contain highly soluble forms of uranium greater than 350 grams of uranium-235 or 200 grams of uranium-233. If the waste contains mixtures of U-233 and U-235, the waste meets the sum of the fractions rule. Highly soluble forms of uranium include, but are not limited to: uranium sulfate, uranyl acetate, uranyl chloride, uranyl formate, uranyl fluoride, uranyl nitrate, uranyl potassium carbonate, and uranyl sulfate. (Based on process knowledge or testing).
- ☐ f. For containers of liquid waste with more than 600 kilograms of waste, the total activity (pCi) of SNM in the manifested container does not exceed the SNM concentration in the above table or Table 1 times 600 kilograms of waste (based on process knowledge or testing). For example, the maximum activity of Pu-239 in any manifested container of liquid waste is 6.0 mCi (6.0E+09 pCi) as shown below:

$$10,000 \frac{\text{pCi}}{\text{g}} \times 600,000 \text{ g} = 6.0 \times 10^9 \text{ pCi} = 6.0 \text{ mCi Pu-239}$$

Figure 3-1. SNM Exemption Certification Form



SPECIAL NUCLEAR MATERIAL EXEMPTION CERTIFICATION

Table 1. Maximum concentrations of SNM in individual waste containers (refer to above table for U-235 limits).

Radionuclide	Maximum Concentration (pCi/g)	Measurement Uncertainty (pCi/g)	Radionuclide	Maximum Concentration (pCi/g)	Measurement Uncertainty (pCi/g)
U-233	75,000	11,250	Pu-241	350,000	50,000
Pu-236	500	75	Pu-242	10,000	1,500
Pu-238	10,000	1,500	Pu-243	500	75
Pu-239	10,000	1,500	Pu-244	500	75
Pu-240	10,000	1,500			

3. Indicate that the following information is attached to the Radioactive Waste Profile Record by checking each box. (Note: Only the two-page Special Nuclear Material Exemption Certification form needs to be included with each manifest).

- ☐ a. Provide a description of how the waste was generated, list the physical forms in the waste, and identify the uranium chemical composition.
- ☐ b. Provide a general description of how the waste was characterized (including the volumetric extent of the waste, and the number, location, type, and results of any analytical testing), the range of SNM concentrations, and the analytical results with error values used to develop the concentration ranges.
- ☐ c. Describe the process by which the waste was generated showing that the spatial distribution of SNM must be uniform, or other information supporting spatial distribution.
- ☐ d. Describe the methods to be used to determine the concentrations on the manifests. These methods could include direct measurement and the use of scaling factors. Describe the uncertainty associated with sampling and testing used to obtain the manifest concentrations.

4. **Generator's certification of compliance with the SNM exemption:** I certify that the information provided on this form is complete, true, and correct and is based on process knowledge, physical observations, or approved laboratory testing. I also certify that sampling and radiological testing of waste containing SNM was performed in accordance with EnergySolutions' Radioactive Material License and that any supporting documentation and analytical results have been submitted to EnergySolutions.

Authorized Signature

Printed Name

Title

Date

Figure 3-1a. SNM Exemption Certification Form (ctd.)

3.1.6 Uranium Waste Shipments

Generators are encouraged to manifest natural uranium as U-Nat and only enriched uranium shipments isotopically. Enriched uranium that exceeds 0.5 grams in mass will require an NRC form 741 to accompany shipping documents.

3.1.6.1 Depleted Uranium

On April 13, 2010, the State of Utah Radiation Control Board voted to impose a moratorium on the disposal of concentrated (defined as $> 5\%$) depleted uranium (DU) at the Clive Facility. Waste containing depleted uranium cannot be manifested greater than 18,000 pCi/g. If the depleted Uranium is manifested isotopically, the limit for U-238 is 16,500 pCi/g. Generators are encouraged to manifest depleted uranium as “U-Dep” rather than isotopically. Compliance with moratorium limits will be evaluated on a manifested container basis. The moratorium does not apply to waste manifested as natural uranium (U-Nat) or Special Nuclear Material with U-235 exceeding 0.711 weight percent.

3.1.7 Radium-226 Waste

The Clive Facility RML authorizes the receipt and disposal of waste containing radium-226 (Ra-226) in concentrations not to exceed 10 nCi/g (10,000 pCi/g). To minimize potential generation of radon-222 gas and subsequent contamination of personnel, areas, and equipment by the radon particulate decay products; shipments containing radium-226 are subject to the following limitations:

- Any shipment containing Ra-226 in concentrations $\geq 1,000$ pCi/g requires approval by *EnergySolutions*’ through the scheduling process in the Customer Portal, and
- Any shipment containing Ra-226 in soil, soil-like material, or easily dispersible material such as fine rubble or floor sweepings in concentrations $\geq 1,000$ pCi/g must be packaged in non-bulk containers (i.e., drums or boxes) unless written approval is obtained from *EnergySolutions*.

3.1.8 Waste Containing Hot Particles

Hot particles are very small – often microscopic discreet radioactive fragments with high specific activity. Some hot particles are capable of delivering a high beta dose rate (>1 rem/hr and higher) to a localized area. They generally consist of radioactive fission and activation products and are insoluble in water. Their size ranges from less than one millimeter down to 10 nanometers or less. Due to their radioactivity, they are usually highly charged. This charge results in their affinity for clinging to skin, hair, and clothing and their ability to jump large gaps between objects. Because of this ability to jump wide distances, they are often referred to as “fleas”. Because of their small size, high specific activity, electrical charge, and very migrant unpredictable nature they are very difficult to control when released into the work area or environment.

Hot particle waste is defined as waste containing or potentially containing hot particles as defined in this document. Additionally, *EnergySolutions* considers any waste material marked as Hot Particle (e.g., pre-printed bags/labels or hand-written information on waste items) to be Hot Particle Waste. Because of potential radiological safety concerns associated with this type of waste, the Clive Facility requires that generators submit hot particle-dedicated profiles for each waste stream that includes hot particles. Please contact a Technical Services representative for further assistance with Hot Particle Waste.

3.1.9 Polychlorinated Biphenyl (PCB) Radioactive Waste

The Clive Facility is authorized to receive and dispose of all types of PCB/radioactive and PCB/mixed wastes defined by the EPA in 40 CFR 761. The EPA issued the Clive Facility a TSCA Coordinated Approval for receipt and disposal of drained PCB Articles and PCB Containers that contained PCBs at concentrations equal to or greater than 500 ppm. Liquid PCB Waste with PCB concentrations greater than 50 ppm will require thermal treatment by VTD.

All regulated PCB waste shipped to the Clive Facility must be profiled in dedicated PCB waste profiles. Customer Portal includes a form that is required to be completed for regulated PCB waste. The form includes check boxes for each of the PCB categories that may be associated with the waste. The form also includes notations, as asterisks, defining those PCB categories that require disposal in the Mixed Waste disposal embankment. EnergySolutions requires that a revised version of this form, with specific categories checked pertaining to the specific shipment, accompany each manifest that contains regulated PCB waste. By regulation, PCB waste types that require disposal at the Mixed Waste Facility must be manifested on a Uniform Hazardous Waste Manifest (even if the waste is not RCRA hazardous). Furthermore, the manifest for regulated PCB waste should include an out-of-service date (note however that the federal regulations in 40 CFR 761.65(a)(1) exempt PCB waste that is radioactive from the 1-year time frame).

For further instructions and descriptions of PCB Waste types, please refer to the WAC Technical Support Document.

3.1.10 Dioxins and Furans

Dioxins/furans are generated by a variety of chemical and thermal industrial processes. Carrying EPA waste codes F020, F021, F022, F023, F026 and F027, dioxins and furans represent some of the most toxic compounds found in waste. The Clive Facility is authorized to receive LDR compliant dioxin/furan waste for direct disposal in the mixed waste embankment. Dioxin/furan waste requiring treatment will be evaluated on a case-by-case basis before acceptance is approved. Like PCB wastes, dioxin/furan waste streams must have dedicated radioactive waste profiles.

3.1.11 UCNI and Export Controlled Waste

The Clive Facility can receive Unclassified Controlled Nuclear Information (UCNI) and Export Controlled Information (ECI) radioactive waste from the DOE. All UCNI and/or ECI waste must be shipped on a profile that is dedicated for that type of waste. All generators are required to notify EnergySolutions in advance when shipments contain UCNI and/or ECI material.

3.1.12 Chelating Agents

The Clive Facility is authorized to dispose of waste containing up to 22 percent by weight chelating agents in the Mixed Waste disposal embankment. Waste disposed of in the LLRW disposal embankment must contain less than 0.1 percent by weight chelating agents. Generators may ship waste containing greater than 22 percent chelating agents to the Clive Facility Treatment Facility once approved during the waste profiling process. The Clive Facility will treat waste containing greater than 22 percent chelating agents prior to disposal in order to comply with this requirement.

3.1.13 Asbestos and Beryllium

The Clive Facility is authorized to dispose of waste containing both friable and non-friable asbestos, and also beryllium containing waste. The asbestos waste must be packaged, marked, and labeled in accordance with applicable federal regulations. Friable asbestos must not be packaged in bulk containers unless approved in writing by EnergySolutions. For waste streams that contain asbestos and/or beryllium, the nature of the hazard needs to be described in the Radioactive Waste Profile Record and within each specific shipment that contains these hazardous wastes. When completing a profile with asbestos waste, the Customer Portal requests specific information describing quantities and categories of asbestos within the waste.

For further instructions on Asbestos and Beryllium waste packaging and notification requirements, please see the WAC Technical Support Document.

3.1.14 Lab Packs

The Clive Facility can receive shipments of lab packs for treatment or sorting and segregation as long as all contents are acceptable for treatment and/or disposal at the facility (e.g., meets all BWF WAC requirements).

For further instruction on lab pack wastes, please see the WAC Technical Support Document.

3.1.15 Reactive Waste

Reactive waste is defined as waste that is normally unstable and can readily undergo violent change (including waste that reacts violently with water or can generate harmful quantities of toxic gases). Reactive waste generally carries the D003 hazardous waste code. EnergySolutions will review the acceptance of reactive waste for treatment on a case-by-case basis. Acceptance may require Utah DWMRC approval. If you have potential reactive waste, please contact a Technical Services representative to evaluate.

Additional information regarding reactive waste can be found in the WAC Technical Support Document.

3.1.16 Battery Management

The Clive Facility is able to receive several different types of batteries for treatment and disposal. The disposition path is dependent upon the chemical composition of the battery. The Clive Facility maintains a variance from the Utah Hazardous and Radioactive Waste Board to allow the macroencapsulation of reactive lithium batteries.

For further guidance on batteries, please see the WAC Technical Support Document.

3.1.17 CERCLA Waste

The Clive Facility is approved to receive, manage, and dispose of EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) waste. EPA Region 8 inspects the facility on a regular basis and provides the proper certifications to receive this type of waste.

3.2 ACCEPTABLE FORMS OF RADIOACTIVE WASTE

3.2.1 Solid Wastes

Solid radioactive waste must contain less than one percent free liquid by waste volume (no free liquids are allowed in waste for direct disposal at the Mixed Waste Facility). Generators shipping solid waste must minimize free liquid to the maximum extent practicable. See the discussions in Section 3.2.5 of this BWF WAC for waste with free liquids. Solid waste includes, but is not limited to, the following forms of waste: soil, sludge, dry active waste, metal, concrete, wood, glass, resin, etc. For simplicity, these waste forms are categorized into either soil or debris waste streams due to the placement criteria specified in the license.

3.2.2 Soil or Soil-Like Wastes

For waste to be considered soil or soil-like, it must meet the following criteria:

- Greater than 70 percent by weight compactable material less than 3/4" particle size and 100 percent compactable material less than 4" particle size
- Maximum dry density greater than 70 pounds per cubic foot (dry weight basis)
- Moisture content of the soil or soil-like waste must not exceed three percentage points above optimum moisture upon receipt at the Clive Facility
- Maximum dry density and optimum moisture must be determined by Standard Proctor Method ASTM D-698

Generators may send samples to a local lab to obtain this data or may send a pre-shipment sample to the Clive Facility to perform compaction testing. Contact a Technical Services representative if you need EnergySolutions to do this testing. If the waste is not soil but determined to be soil-like, the compaction test results must be included as part of the waste profile submittal.

Shipments of soil or soil-like waste streams may contain up to 30% standard size debris (described in Section 3.2.3.1 of this BWF WAC) in waste packages (container basis). The maximum percentage of debris in the waste stream must be listed in the waste profile.

Soil or soil-like waste streams with moisture content exceeding three percentage points above optimum moisture are acceptable by the Clive Facility but require additional management prior to disposal. Note that in many instances, absorbed liquids do not exhibit soil-like properties. Contact a Technical Services representative prior to shipping soil or soil-like waste streams with elevated moisture content.

Generators are requested to identify U.S. Department of Agriculture (USDA) regulated soils in the waste profile. Of particular concern are USDA regulated quarantine soils with the potential for witchweed, fire ants, golden nematodes, and corn cyst nematodes. Generators should contact a Technical Services representative if waste is regulated by the USDA.

3.2.2.1 Highly Dispersible or Elevated Dose Waste

Due to safety and contamination concerns, some highly dispersible waste (e.g., filter cake, dusty material, etc.) or waste with elevated dose rates may require disposal within the waste container as debris. Highly dispersible and elevated dose soil-like waste must be described in the Waste Profile and the shipping paperwork.

3.2.3 Debris

Waste material not meeting the specified soil or soil-like properties described above is considered debris by EnergySolutions. Debris includes both decommissioning and routinely generated operational waste including, but not limited to, radiologically contaminated paper, piping, rocks, glass, metal, concrete, wood, bricks, resins, sludge, tailings, residues, and personal protective equipment (PPE). Debris is defined into two broad categories based on size: standard size debris and oversize debris.

3.2.3.1 Standard Size Debris

Standard size debris includes materials that are less than 10 inches in at least one dimension and no longer than 12 feet in any dimension. Debris that does not meet this size criterion is categorized as oversize debris.

3.2.3.2 Oversize Debris

Waste material is considered oversize debris if the debris has at least one dimension greater than 12 feet or does not have one dimension less than 10 inches. The Clive Facility must dispose of oversize debris in a different, and more costly, manner than standard size debris. Oversize debris will typically be placed on a separate waste profile from standard size debris.

3.2.3.3 Large Components

Large components are a subcategory of oversize debris. The Clive Facility has received and disposed of several large components over 250 tons including steam generators, reactor heads, turbine components, and other large equipment. Generators should identify the potential for these waste items as part of the waste profiling process. Large components should have dedicated profiles that can be updated with specific information regarding each large component shipped to the Clive Facility.

Generally, single items over 20,000 pounds are considered large components and require special handling and engineering reviews prior to placement. The Clive Facility requires waste-specific information for each large components shipped to the facility. The type of information required includes drawings, photographs, weight, dimensions, description of enclosed voids, packaging configuration, a rigging and loading plan, identification of lifting points, transportation mode, and radiological characterization and survey documentation. Generators are requested to provide this type of information as early as possible in the project planning to help facilitate safe, efficient offloading at Clive.

Generators can fill void spaces within large components with any material that can flow into the voids (e.g., grout, vermiculite, packing foam, etc.). If the generator cannot fill all void spaces within large components, the void spaces must be made accessible via a minimum of two access ports to allow grout in-fill during disposal operations at the Clive disposal facility. Access ports must be at least four inches in diameter unless approved in writing by EnergySolutions. Containers of oversize debris must exclude soil or soil-like waste due to placement criteria. Generators should be aware that waste disposed of as large components is required to be free of external contamination.

The Large Component disposal cell is a radiologically non-contaminated area. Furthermore, waste with dose greater than 80 mR/hr at 30 cm cannot be disposed in this area.

3.2.3.4 Resin Waste

In accordance with the Clive Facility RML, ion-exchange media (resin) is required to be disposed of as debris at the Clive BWF Facility. Resin waste streams being disposed at the BWF must be shipped under a resin-specific waste profile unless approved in writing by *EnergySolutions*. Any waste that contains resin greater than one percent by volume is considered resin waste.

3.2.4 Gaseous Waste

The Clive Facility is authorized to receive gaseous waste in accordance with Utah Administrative Code R313-15-1009(2)(a)(viii). Gaseous waste must be packaged at an absolute pressure that does not exceed 1.5 atmospheres at a temperature of 20 degrees Celsius and the total activity of any container shall not exceed 100 Curies. This information must be identified in the Radioactive Waste Profile and shipping paperwork. **Approval is required prior to shipping gaseous waste to the Clive Facility.**

3.2.5 Waste Containing Free Liquids

The Clive Facility is approved to solidify and/or treat waste containing aqueous or non-aqueous free liquids. Liquid radioactive waste is solidified at the Treatment Facility prior to disposal (in either the Mixed Waste or LLRW Embankments). The facility may accept waste in liquid-rated containers or tanker trailers. Bulk liquid storage is limited at Clive; therefore, please contact a Technical Services representative prior to scheduling a tanker of liquid waste.

Non-aqueous radioactive liquids greater than one percent of the waste volume, on a container basis, requires approval from the Utah DWMRC before they can be shipped to the facility (LLRW or Mixed Waste). This may cause delays approving a Radioactive Waste Profile and the extra time should be factored in by the generator. Aqueous liquids do not have this restriction.

3.2.5.1 LLRW Free Liquids

LLRW wastes containing free liquids greater than one percent by volume are considered liquid waste streams. Generators may use visual inspection of the waste or the Paint Filter Liquids Test to determine if the waste contains free liquids. The Radioactive Waste Profile must describe the physical, chemical, and radiological characteristics of the liquid waste.

Shipments containing unauthorized free liquids (liquids greater than one percent that was not identified in the Radioactive Waste Profile) within any package in the shipment is a significant cause of non-compliance. Each incoming shipment will be tested for free liquids in accordance with The Clive Facility Waste Characterization Plan (within the RML) using visual inspection of the waste or the Paint Filter Liquids Test. If a solid waste shipment is found to contain unauthorized free liquids greater than one percent of the waste volume in any manifested container, *EnergySolutions* is required to promptly notify the generator and the Utah DWMRC. Furthermore, if the unauthorized liquid is non-aqueous, the Utah DWMRC approval process must be completed before the waste can be managed at the facility. *EnergySolutions* will work with the generator to develop a plan for the management of the waste and may require documented corrective actions to be performed by the generator.

To control free liquid within the waste material, the use of absorbent materials is strongly recommended. Sufficient absorbent material to absorb twice the volume of the potential liquid should be used. Generators should be aware that some soil matrices actually ‘bleed’ moisture out during transport due to vibration. This should be factored into any shipments that are suspected to contain liquids within the waste matrix.

Although uncommon, in some cases it is possible for precipitation to enter the package resulting in free liquids. Detailed inspections should be completed before waste is placed in transit to ensure the package meets strong-tight criteria and that water cannot enter. A list of recommended absorbents is included in the WAC Technical Support Document. Other absorbent may be used, but please contact Technical Services for confirmation. *EnergySolutions* requests that polymer super-absorbents be used minimally or not at all as that negatively affects disposal of the waste. If absorbents are added to the waste, the specific absorbent must be identified in the Radioactive Waste Profile Record.

3.2.5.2 Mixed Waste Free Liquids

Mixed Waste cannot contain any free liquids at the time of disposal (the waste must pass the Paint Filter Liquid Test). Mixed Waste direct disposal shipments that contain free liquid will be managed as described for LLRW unauthorized liquids in Section 3.2.5.1 of this BWF WAC. Mixed Waste shipments for treatment with unexpected non-aqueous liquids greater than one percent will also require Utah DWMRC approval before the waste can be managed. If unexpected free liquids are found in a shipment designated for Mixed Waste treatment, additional treatment may be necessary. Technical Services will contact the generator if this situation occurs.

3.2.5.3 Aerosol Cans

Aerosol cans may be received for treatment or disposal. Empty punctured aerosol cans may be disposed as LLRW debris. Unpunctured aerosol cans are considered ‘reactive’ waste (due to their internal pressure) and must be managed as Mixed Waste, regardless of the contents. If the contents are organic the internal liquids may require thermal treatment by VTD after the cans have been punctured.

3.2.6 Sealed Sources

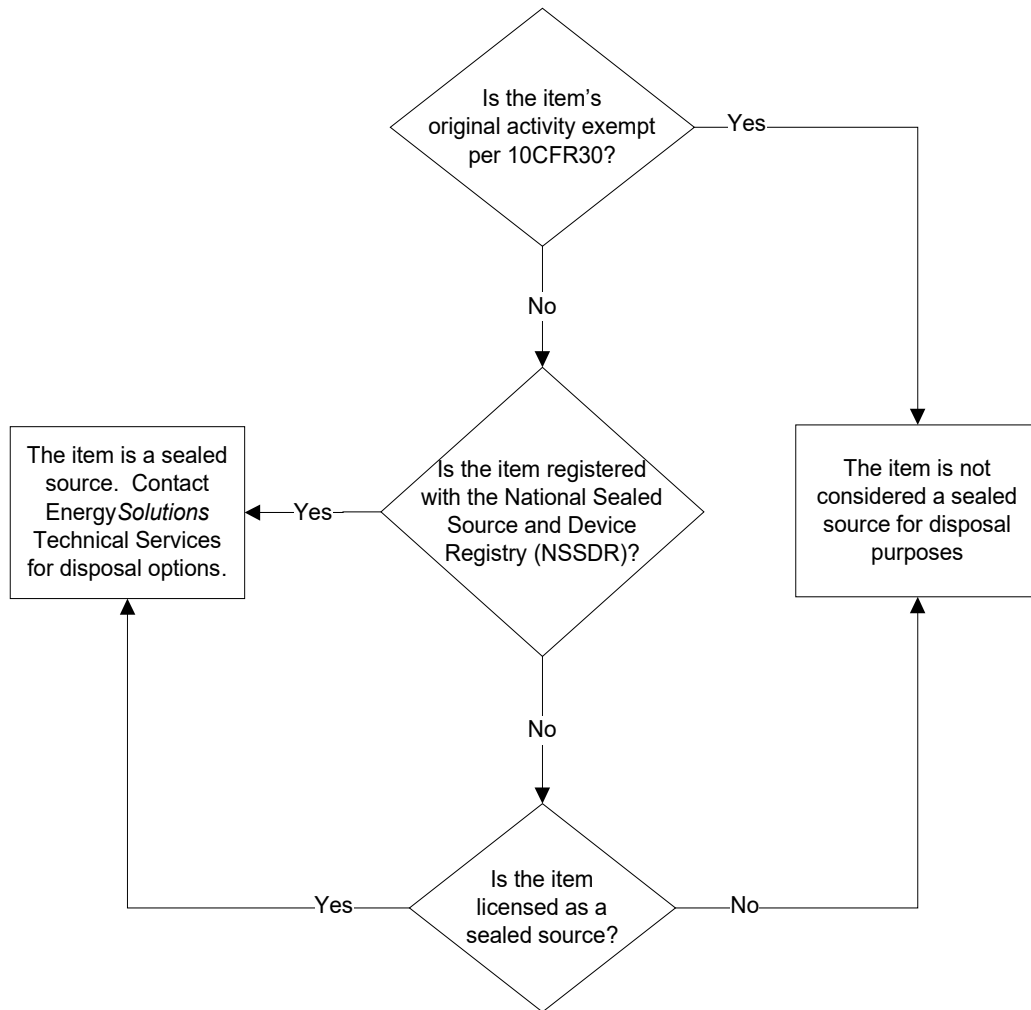
Sealed sources are defined in UAC R313-12-3 as “radioactive material that is permanently bonded or fixed in a capsule or matrix designed to prevent release and dispersal of the radioactive material under the most severe conditions which are likely to be encountered in normal use and handling.”

Sealed sources that by themselves meet the definition of Class A in UAC R313-15-009 (see Section 3.1.1 of this BWF WAC) may be directly disposed in the CWF. This type of sealed source may also be disposed in the BWF but requires Utah DWMRC approval prior to shipment. Due to reporting requirements in the Clive Facility RML, contact Technical Services for all sealed sources shipped to the Clive Facility.

Sealed sources that require use of the NRC BTP on Concentration Averaging (see Section 3.1.1.1 of this BWF WAC) to meet Class A concentrations cannot be disposed at the BWF (but may be disposed at the CWF; please refer to the CWF WAC).

Sealed sources with activity below the exempt levels noted in 10 CFR 30 (UAC R313-19) or are not licensed as a sealed source is not considered a sealed source by this section and may be shipped with other Class A waste. Figure 3-2, below, is a flowchart providing further guidance on determining when items need to be considered a sealed source for disposal purposes.

Figure 3-2. Sealed Sources Determination Flowchart



3.2.7 Smoke Detectors

Smoke detectors are not considered sealed sources and are approved for disposal at the Clive Facility as long as each package meets Class A concentrations (see Section 3.1.1 of this BWF WAC). The NRC BTP on Concentration Averaging may be used to meet the concentration limit, but the requirements in Section 3.1.1.1 of this BWF WAC must be followed.

3.3 PROHIBITED RADIOACTIVE AND MIXED WASTE

The Clive Facility RML **prohibits** receipt of the following wastes:

- Radioactive waste which is classified as Class B, Class C, or Greater Than Class C waste.
- Solid waste containing unauthorized free liquids (see Section 3.2.5 of this BWF WAC).
- Waste material that is readily capable of detonation, of explosive decomposition, reactive at normal pressure and temperature, or explosively reactive with water.

- Waste materials that contain or are capable of generating quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste.
- Waste materials that are pyrophoric. Pyrophoric materials contained in wastes must be treated, prepared, and packaged to be nonflammable. Neither pyrophoric solids or potentially pyrophoric solids, as defined below, may be accepted:
 - Ignitable (pyrophoric) solids: solid substances that under normal conditions (~ standard temperature and pressure) are capable of causing fire through friction, absorption of moisture, or spontaneous chemical change; or can be ignited readily and when ignited burns vigorously and persistently.
 - Potentially ignitable (pyrophoric) solids: solid substances in which shavings or other small particles that may be generated through management of the material meets the definition of an ignitable material.

Note: As mentioned in Section 3.1.15 of this BWF WAC, reactive waste may be accepted for treatment on a case-by-case basis under certain conditions. A Technical Services representative may be contacted to determine if deactivation at the Clive Facility is a viable alternative.
- Waste materials containing untreated biological, pathogenic, or infectious material including contaminated laboratory research animals.
 - Generators desiring to ship this type of waste must document in the Radioactive Waste Profile Record the process used to treat the potential non-radiological hazard.
- Sharps including needles, scalpels, knives, syringes, pipettes, and similar items having a point or sharp edge or that are likely to break during transportation must not be packaged in bulk containers unless written approval is given by EnergySolutions.
 - When these items are used in the medical industry or related research, they must be treated to remove the biohazard. Documentation of such treatment must be included in the Waste Profile.
 - If sharps are expected in a shipment, they should be noted in the Radioactive Waste Profile Record and in the shipment documentation.

The following Mixed Wastes are **not** acceptable for treatment or disposal at the Mixed Waste facility:

- Hazardous waste that is not also a radioactive waste
- Wastes that react violently or form explosive reactions with air or water (without written approval by EnergySolutions)
- Pyrophoric wastes and materials (without written approval by EnergySolutions)
- DOT Forbidden, Class 1.1, Class 1.2 and Class 1.3 explosives
- Shock sensitive wastes and materials
- Compressed gas cylinders, unless they meet the definition of empty containers (see Section 3.2.4)
- Utah waste codes F999 and P999

SECTION 4

WASTE ACCEPTANCE PROCESS

4.1 WASTE PROFILING PROCESS

This section details the Clive Facility waste characterization and profiling process. Profiling a waste stream involves collecting samples and obtaining analytical results for the parameters specified on *EnergySolutions*' Radioactive Waste Profile Record (Waste Profile). The Waste Profile serves the following functions:

- (1) enables the Clive Facility to evaluate wastes for acceptance,
- (2) maintains an operating record for the material during acceptance, storage, treatment, if applicable, and disposal of waste shipments,
- (3) provides a historical record of the waste project for each waste stream, and
- (4) ensures compliance with Clive Facility licenses and permits.

Waste Profiles should be specific to waste generation processes and waste type (waste streams). In general, Waste Profiles should only have one type of waste in them (e.g., liquids or solids); however, there are times when the process that generated the waste does not differentiate waste types and sorting/segregation may be required at the Clive Facility. Waste Profiles should also be specific to a management process at the Clive Facility (e.g., LLRW disposal, Mixed Waste stabilization treatment, VTD, etc.).

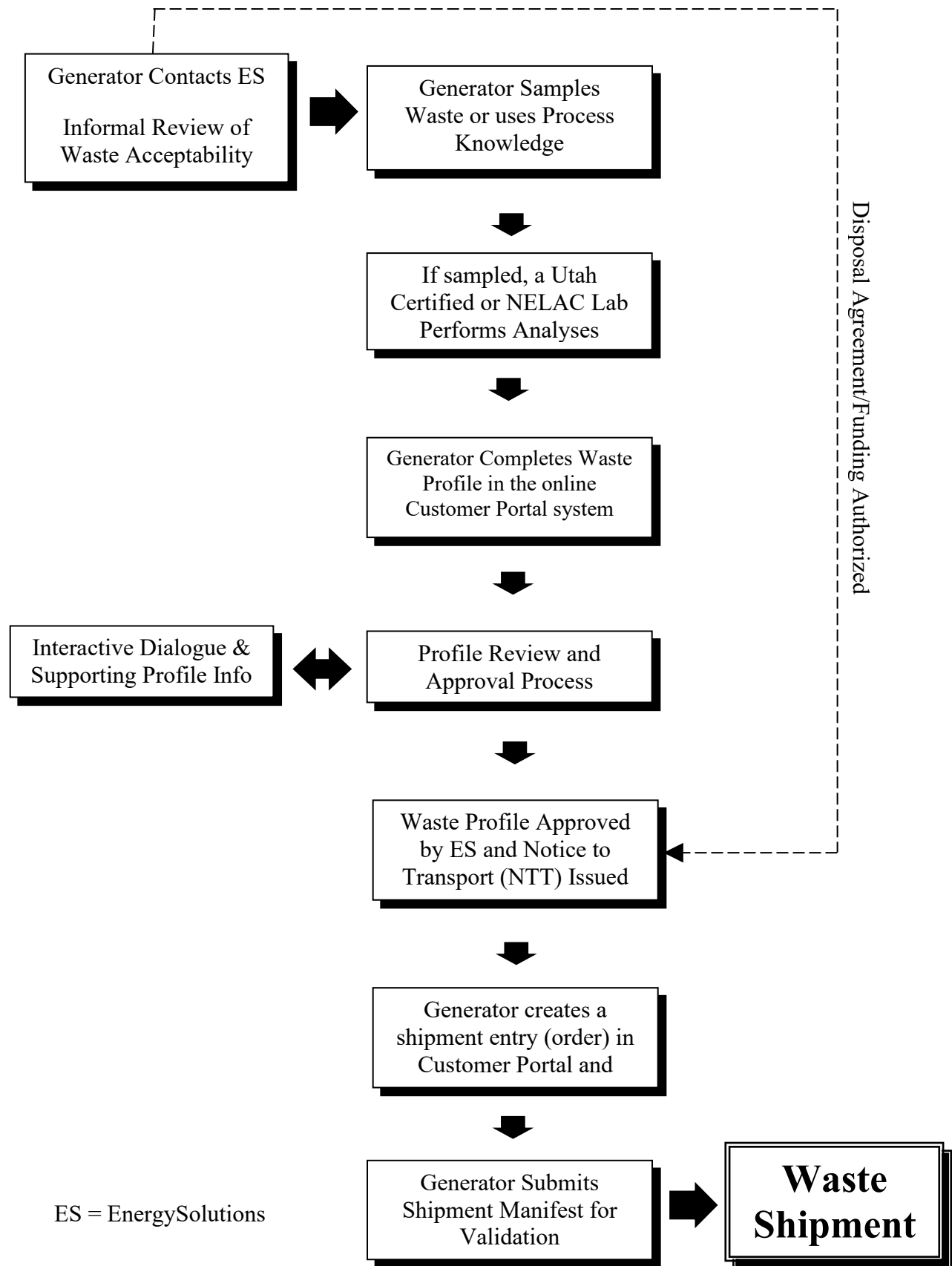
EnergySolutions has an online Customer Portal profiling and manifesting system that allows customers to complete the profiling information online as well as submit scheduling requests and manifests. The Customer Portal is accessible via the *EnergySolutions* website at www.energysolutions.com. Navigation of the Customer Portal waste profiling process is described in the WAC Technical Support Document. Furthermore, a Technical Services representative is available to assist in the waste profiling process if needed.

The waste profiling process consists of the following steps as illustrated in Figure 4-1:

- Initial discussions
- Waste characterization
- Waste Profile completion and submittal
- Profile review and approval
- Notice to Transport

Initial discussions of the waste stream are critical in ensuring that the waste profiling process is accurate and efficient. Technical Services representatives are a resource to the generator in completing this process.

Figure 4-1. Waste Acceptance Process



4.2 WASTE CHARACTERIZATION

Early in the process, the generator samples the waste stream where applicable and begins to accumulate the analytical data required in the Waste Profile described below. For wastes that may be sampled, the Clive Facility RML and Part B Permit requires that chemical analyses (described in Section 4.3.2 of this BWF WAC) are performed by laboratories certified by either the State of Utah or the National Environmental Laboratory Accreditation Conference (NELAC). Contact Technical Services if unsure of the certification of the laboratory used. Once the analytical support data is obtained, the generator completes the Waste Profile as described in the following section.

4.3 RADIOACTIVE WASTE PROFILE RECORD

The Radioactive Waste Profile Record is a document required by Clive Facility licenses and permits. The information provided in the Radioactive Waste Profile Record helps the Clive Facility manage waste safely and compliantly. It provides information about waste shipped to the Clive Facility in the following areas:

- Generator and waste stream information
- Physical properties and packaging
- Radiological information
- Chemical composition and hazard evaluation

Waste generators must complete a Radioactive Waste Profile Record for every waste stream shipped to the Clive Facility. To complete this profile, the generator should use process knowledge along with analytical laboratory results, as necessary. The Radioactive Waste Profile Record is to be completed via the online Customer Portal.

The first step in completing a Customer Portal profile is to obtain access. Access is acquired on an individual basis. If access is needed, contact a Technical Services representative and provide a contact email and telephone number. Once access is provided, the individual will receive an email from Customer Portal with a link to update their password. The individual will be presented with a CAPTCHA containing a simple math equation. The mathematical answer should be submitted, not a repeat of the equation. If a password is ever lost or doesn't seem to be working, clicking on the "Forgot password" in the sign in page will send a new reset email to the individual's email address.

Customer Portal has been created for ease of use with the generator filling out electronic 'forms' to fully describe their waste. The Customer Portal profile area includes a general profile information section and the following tabs to provide waste detail:

- Waste Summary
- Physical Properties
- Radionuclides
- Low Level Radioactive Waste / Hazardous Waste
- Special Nuclear Material
- PCB
- Asbestos
- CWF
- Attachments

The Customer Portal profile area is programmed such that tabs are greyed out and not required until appropriate options are selected in other sections of the profile (e.g., the PCB tab is not accessible and not required to be filled in unless regulated PCBs are noted in the Waste Summary tab).

The following sections describe the profiling process in Customer Portal. More detailed descriptions of the process can be found in the WAC Technical Support Document.

4.3.1 Generator and Waste Stream Information

This includes the Profile Information section that always remains at the top of the profile as well as the Waste Summary tab. The Profile Information section provides overall description of the waste in the profile including the Waste Profile ID, Waste Stream Name, and Waste Location. If the waste is a Mixed Waste, the generator's site EPA ID Number should also be included in this section.

In the Waste Summary tab, the generator must answer a series of questions designed to categorize the waste material that is profiled. The generator identifies the following:

- If the waste is hazardous and whether it has been treated previously or requires treatment at the Clive Facility
- If the waste is Low-Level Radioactive Waste
- If the waste contains Special Nuclear Materials, PCBs, or asbestos

4.3.2 Waste Physical Properties and Packaging

The Physical Properties tab is where physical and geotechnical properties of the waste is described, including gradation of the material, density range, a full description of the physical composition and characteristics of the waste, moisture content, optimum moisture, and maximum dry density determined by the Standard Proctor Method (for soil or soil-like materials).

The purpose of the physical and geotechnical testing requirements is to demonstrate that the material can be managed at the Clive Facility under existing license/permit requirements and in accordance with *EnergySolutions'* waste disposal placement methods.

The gradation of the waste may be determined through analysis or waste process knowledge. After an assessment of the entire waste stream, the generator is expected to estimate the amount of material that would pass through the various screens indicated. This information is necessary to determine the method of waste placement.

In this tab, the generator also addresses questions regarding free liquids. If the waste contains free liquids, the Waste Profile requires a description including the quantity and nature (aqueous or non-aqueous) of the liquid. Solid waste profiled to contain incidental free liquids (less than one percent of the waste volume on a container basis) must be minimized to the maximum extent practical but in no case shall the free liquid exceed one percent of the waste volume upon arrival and inspection at the Clive Facility. Waste streams containing PCBs must not contain any free liquids unless shipped for VTD treatment.

The generator also needs to include how the waste will be packaged for receipt at Clive. This helps aid the Clive Facility to ensure correct equipment is available to safely offload and manage the waste.

The waste description is continued by addressing several items in a narrative description and history of the waste provided by the generator in the narrative section of the online waste profile. The narrative should include the following items as applicable:

- The process that generated the waste
- Waste material physical composition and characteristics
- Radiological and chemical characterization methods
- Information requested on the SNM Exemption Certification, if applicable
- The type and description of PCB waste, if applicable
- Basis for determining manifested radionuclide concentrations
- Description and amounts of absorbents, if applicable
- Basis of non-hazardous or hazardous waste determinations
- Treatment processes, if applicable
- Product information or Material Safety Data Sheets associated with the waste as applicable
- Information requested in other sections of the Waste Profile

4.3.3 Radiological Information

All waste streams must be analyzed to determine the radionuclide concentrations in the waste. The waste must be characterized via gamma spectroscopy, liquid scintillation, or other standard radiochemistry methods to determine the radionuclide concentrations in the waste. Indirect measurements such as dose-to-curie or use of scaling factors may also be used if the process has been validated with direct measurements. Radiological analysis does not need to be performed by Utah or NELAC Certified laboratories. Non-gamma emitting radionuclides such as Fe-55 and Ni-63, may be scaled from the gamma spectral analysis obtained from testing the material if the waste generator has specific process knowledge of the material being profiled (10 CFR Part 61 analyses).

Please note that discrepancies between radiological information, particularly concentration ranges, and waste manifest documents could delay or prevent acceptance of a shipment. The Waste Profile must always be reviewed with the waste manifest documents prior to shipping waste to the Clive Facility. In the event that radiological, physical, or chemical properties of a profiled waste stream have changed, an update (revision) to the Waste Profile must be submitted and approved before such waste can be shipped to the Clive Facility.

EnergySolutions requires that generators evaluate the maximum dose rates and contamination levels anticipated in each waste stream. In the Radionuclides tab, the generator indicates whether or not the maximum dose rate on accessible surfaces exceeds the ALARA Criteria as described in Section 2.4.1 of this BWF WAC.

While the Clive Facility is permitted to receive Class A LLRW, certain radionuclides are subject to additional controls established by the Utah DWMRC. For example, Radium-226 is limited to 10,000 pCi/g. In addition, the Utah DWMRC regulates the following radionuclides within the Clive Facility RML:

- Berkelium-247
- Calcium-41
- Chlorine-36
- Iodine-129
- Rhenium-187
- Technetium-99

EnergySolutions is required to notify the Utah DWMRC when disposing of these nuclides in the Class A disposal embankment. For waste shipped for disposal in the Mixed Waste disposal embankment, EnergySolutions must notify the Utah DWMRC of waste containing Chlorine-36 and Berkelium-247. In order for the Clive Facility to make these notifications, the generator is required to include the anticipated presence of these nuclides within the radiological information provided in the Waste Profile.

In the Radionuclides tab, the generator lists the radionuclides present in the waste stream in conjunction with the expected maximum manifested concentration and the weighted average concentrations expected for each radionuclide. The generator is expected to manifest values for each shipment that are within the maximum values stated in this section of the Waste Profile. In the event that a generator needs to ship waste to the Clive Facility that exceeds the limits in the radiological information section of the Waste Profile, the generator must submit a revised Waste Profile to EnergySolutions for review and approval. If the increase is minimal, this may be done internally. A Technical Services representative should be contacted if there are any questions.

Any additional information including laboratory results for gamma spectroscopy or radiochemistry analysis must be attached to the Waste Profile. Radiological characterization methods and the basis for determining manifested radionuclide concentrations should be included in the waste description narrative as described in section 4.3.2 above.

4.3.4 Chemical Composition and Hazardous Waste Evaluation

In accordance with the response to the hazardous waste question posed in the Waste Summary tab, the generator fills in either the 'Low Level Radioactive Waste' or the 'Hazardous Waste' tab to address the chemical composition of the waste. In either case, the generator must provide chemical analytical data or process knowledge of the chemical properties of the waste, as applicable.

Some of the analyses described below may be waived due to the form of the waste (e.g., debris) or through process knowledge of the waste and/or waste generation process. Justifications must be provided for all waived analyses. Contact a Technical Services representative if there are any questions on what may be waived.

4.3.4.1 Low Level Radioactive Waste

If the Waste Summary tab states the waste is not classified as hazardous waste, the generator must fill in the now available Low Level Radioactive Waste tab in the Customer Portal. The Clive Facility RML (Waste Characterization Plan) requires the following results be provided:

Analysis	EPA SW-846 Method
pH (liquids only)	Method 9045
TCLP Metals	Method 6010/7470
TCLP Herbicides	Method 8151
TCLP Pesticides	Method 8081
TCLP Semi-volatiles	Method 8270
TCLP Volatiles	Method 8260

The individual chemical compounds required for these analyses are listed in the Low Level Radioactive Waste tab and correspond to the characteristic D-list constituents (D004 through D043) identified in 40 CFR 261.24.

More information regarding this required data is provided in the WAC Technical Support Document.

The tab also includes a question as to whether the waste was a hazardous waste at the point of generation, and a section to address former hazardous waste codes and additional chemical constituents as applicable.

4.3.4.2 Hazardous Waste

If the waste was denoted hazardous in the Waste Summary tab, the generator must fill in the now available Hazardous Waste tab in the Customer Portal. The Clive Facility Part B Permit requires the following results be provided:

Analysis	EPA SW-846 Method(s)
pH (liquids only)	Method 9045
PFLT (direct disposal waste only)	Method 9095
Organics (Totals)	Method 8260 & 8270
Results from applicable concentration-based treatment standards	

Applicable analytical data reports should be uploaded in the profile in the Customer Portal.

The Hazardous Waste tab includes sections to list all hazardous waste codes and Underlying Hazardous Constituents (UHCs, as defined in 40 CFR 268.48) applicable to the waste stream, including hazardous waste subcategories and worst-case concentrations. These hazardous waste codes must encompass all codes manifested in shipments to the Clive Facility. The profile may be revised to add additional codes if necessary.

The tab also has a section to describe any other chemical constituents that may be present in the waste. This information is critical in evaluating wastes for safe and compliant treatment at the Clive Facility.

4.3.5 Special Nuclear Material Exemption Certification

Waste containing Special Nuclear Material (SNM) must comply with the Clive Facility SNM requirements for concentration, spatial distribution, chemical mixture, solubility and chemical composition of SNM isotopes. If SNM is noted in the Waste Summary tab, the Special Nuclear Material tab will be made available and the form (see Figures 3-1 and 3-1a for a depiction of the current form) and supplemental information is required to be completed. All information must be provided.

Information needed to fill in this tab is described in the WAC Technical Support Document.

4.3.6 PCB Waste Certification

As described previously and in the WAC Technical Support Document, the Clive Facility is authorized to receive, treat, and dispose of any type of PCB waste. If the Waste Summary tab is checked yes for regulated PCB waste, the PCB tab will be available to fill in the types of PCB waste associated with the

profile. Those PCB types that require Mixed Waste disposal are denoted with an asterisk (*) in the tab and those requiring flush certificates with a double asterisk (**).

4.3.7 Asbestos Certification

If asbestos or asbestos containing material (ACM) is present in the waste, it should be noted in the Waste Summary tab. When this occurs, the Asbestos tab will be available to denote whether the asbestos is friable and to certify that the asbestos will be managed in accordance with regulatory requirements (40 CFR 61 Subpart M). A section is also available to describe the type of asbestos present in the waste.

4.3.8 Additional Information

The Customer Portal profile area has three additional tabs to provide additional support. These tabs are Comments, Transaction History, and Contacts. Comments may be used by the generator to put in any additional information they feel is appropriate to the waste. The Contacts tab allows the generator to see all individuals that have rights to access the profile, and the Transaction History shows all changes to the profile as well as *EnergySolutions*' approvals. Any questions about this data may be directed to a Technical Services representative.

4.4 WASTE PROFILE REVIEW AND APPROVAL

EnergySolutions will assist waste generators throughout the waste profiling process to ensure shipping and acceptance of the waste can be accomplished within the desired timeframe. In order to facilitate timely shipment and receipt of waste materials, *EnergySolutions* requests that the Waste Profile and analytical reports be provided as far in advance of the anticipated shipping date as possible.

In order to assist each generator and accomplish the profile review and approval process as quickly as possible, *EnergySolutions* has developed a two-phase review process. During the first phase, a Technical Services representative will review and assess the Waste Profile, accompanying documentation, and analytical data for acceptability. If necessary, *EnergySolutions* will provide comments that delineate additional information needed for approval. This process typically takes two to five working days. Once the additional information or revisions have been received by *EnergySolutions* and found to be satisfactory, phase two of the process begins.

The second phase involves an independent evaluation of the Waste Profile by Clive Facility Health Physics, Compliance, Operations, and Safety and Health representatives. The online Customer Portal allows the customer to view the status of the profile as it is being reviewed and approved by *EnergySolutions* and will provide notification via email when the profile is approved.

4.5 NOTICE TO TRANSPORT

After all evaluations are completed and the profile is approved, *EnergySolutions* (through the Customer Portal) issues a Notice to Transport (NTT) to the generator. The NTT authorizes the generator to ship waste to the Clive Facility. When the profile is approved, the NTT is automatically uploaded to the "Attachments" tab in the Customer Portal profile area.

A new NTT is issued any time the profile is revised, whether by customer revision or automatically every third year as described in Section 4.6 of this BWF WAC.

The Clive License does not allow waste to be received without a valid NTT.

4.6 PROFILE REVISIONS

From time to time, waste information needs to be changed in a profile (e.g., additional isotopes or hazardous codes are found in the waste, isotope upper concentrations need increased, etc.). It is easy to revise information in a profile within the Customer Portal; just click on the orange “Revise” button within the Profile Information section and update the profile as needed.

EnergySolutions requests that each time a revision is made that the narrative (at the bottom of the Physical Properties tab) be updated with the revision number and a general description of the changes made in that revision. This provides a clear record of profile revisions over time.

When a profile revision is submitted, it goes through the same approval process as an initial profile, and a new NTT is issued by Customer Portal after it is approved.

Sometimes revisions are minor and do not affect the way the Clive Facility needs to manage the waste (e.g., an additional “Other Chemical Constituent” or small isotope concentration increases). This type of revision can be done internally by EnergySolutions’ Technical Services and does not require a full profile review or a new NTT. Contact a Technical Services representative if minor profile changes are needed. Furthermore, a Technical Services representative may contact a generator if a submitted revision appears minor and may be able to go this route rather than a full profile revision.

Profiles may require automatic revision also. This occurs during the shipping process described in the next Section. If it has been one or two years since the profile was last reviewed and approved, upon submitting an order in the Customer Portal, a pop-up box will appear asking if there are any required changes to the profile. If “Yes” is selected, the profile will need revised (as described above) before the shipment can be approved. If “No” is selected, no changes are necessary. On the third year after a profile has been approved, a different pop-up box will appear stating that the profile needs reviewed and re-approved before the shipment is approved. This review process will take place upon the shipper clicking “OK” on this pop-up box. Note that the individual clicking the box needs to have profile editing rights in Customer Portal or the request will not be submitted to Technical Services. If this is the case, contact a Technical Services representative to get the process started. The generator will receive an email when the review process has been completed and a new NTT will be issued, but a revision will not be added to the Waste Profile Record.

4.7 SPECIAL WASTE SHIPMENT AUTHORIZATION

There may be times when a unique situation occurs that requires special management of a single shipment within a Waste Profile. Examples of this include:

- A shipment contains waste that exceeds the ALARA criteria in Section 2.4 of this BWF WAC
- A shipment contains an exceptionally heavy item
- A shipment has a special container that needs returned to the generator
- A shipment has a safety concern such as highly dispersible waste

When a waste requires special management (such as the examples above), two options are available:

- 1) a new Waste Profile can be created for the one shipment or
- 2) a Special Waste Shipment Authorization (SWSA) may be filled out for one specific shipment within an existing Waste Profile.

A SWSA may be created by clicking on the blue “SWSA List” button on the top right of the profile or at the time of a shipment. When creating a SWSA, the form asks for a Shipment Number (if known), a Waste Shipment Description (stating why this waste requires a SWSA), and a package description.

When a SWSA is submitted, it goes through a similar review process as a Waste Profile. Once approved, the generator receives an email stating it is approved and then they are free to add it into the specific shipment it was created for.

Note that any requests for ALARA criteria exceedances requires radiation and contamination surveys of the container and/or waste item. Dose rate measurements on contact and at one foot from the waste should be provided on the radiation survey.

SECTION 5

SHIPMENT SCHEDULING AND MANIFESTING

5.1 GENERATOR SITE ACCESS PERMIT

Prior to the first shipment of waste material to the Clive Facility, and annually thereafter generators must receive a Generator Site Access Permit (GSAP) issued by the Utah DWMRC. Utah Administrative Code R313-26 establishes the terms for a Generator Site Access Permit Program that authorizes waste generators, waste processors, and waste collectors to deliver radioactive waste to a disposal facility within Utah. Generators may apply for the GSAP on-line at the Utah DWMRC's website at <https://deq.utah.gov/waste-management-and-radiation-control/generator-site-access-waste-management-and-radiation-control-permits-and-permitting>. Generators should be aware that the length of time the Utah DWMRC takes to process a GSAP application or annual renewal is typically thirty days but can be expedited if necessary (contact a Technical Services representative for help expediting if needed).

The GSAP number must be listed in Block 5 of the Uniform LLRW Manifest Form 540 and correspond to the shipper's name and facility. Shippers must ensure the GSAP is renewed annually with the Utah DWMRC. A generator must have an active GSAP at the time the waste arrives at the Clive Facility.

Shippers are subject to the provisions contained in the "Generator Site Access Permit Enforcement Policy" as amended, UAC R313-14, and UAC R313-19-100 for violations of state rules or requirements in the current land disposal facility operating license regarding radioactive waste packaging, transportation, labeling, notification, classification, marking, or manifesting requirements.

5.2 5 WORKING-DAY ADVANCED SHIPMENT NOTIFICATION

Generators must schedule the shipment to arrive at the facility a minimum of five working days prior to the requested shipment arrival date. This is done by placing a shipment order into Customer Portal.

EnergySolutions requires generators to submit the schedule request (Customer Portal order) prior to the shipment departing from the generator's site. Once the schedule request has been received, the Scheduling Department will confirm the shipment's arrival date with the shipper via Customer Portal and approve the shipment within Customer Portal. Shipments must not be sent to the Clive Facility without approval.

If all required information is not available at the time of submission, updates may be provided as the information becomes available. The Scheduling Department must be informed as soon as possible in the event that there are delays in the shipment scheduled arrival date. All updates to shipment orders must be done in Customer Portal.

Shipments containing radionuclides with total activities exceeding the limits listed in Table 5-1 must be specified in the Customer Portal shipment order and approved prior to waste shipment.

Table 5-1. Unusual Isotope Activity Exceedance Limits

Isotope	Curie Limit
Cf-252	5.4
Co-60	8.1
Cs-137	27
Gd-153	270
Ir-192	22
Pm-147	11,000
Se-75	54
Tm-170	5,400
Yb-169	81

5.3 SHIPPING PAPERWORK

Advance copies of the Uniform Low-Level Radioactive Waste Manifest (Forms 540/541, and 542 if applicable) are required to be sent to EnergySolutions at least three working days prior to the shipment arrival date. Shippers must submit the shipping paperwork electronically via the online Customer Portal. EnergySolutions requires submittal of the Uniform LLRW Manifest electronically by exporting the manifest information to a specified file format as discussed below. The advance manifest must include the Uniform LLRW Manifest, and if applicable, LDR Notification/Certification forms, Uniform Hazardous Waste Manifest, and SNM Exemption Certification form.

Additional shipping paperwork may be required depending on the type of waste being shipped to the Clive Facility. Multiple waste streams on a single conveyance must include a unique set of LLRW shipping paperwork for each manifested shipment. The following paperwork may also need to accompany the shipping paperwork as applicable:

- SNM Exemption Certification form. This form must be completed, signed (within at least 180 days prior to the ship date), and included with the shipping paperwork for shipments containing Special Nuclear Material.
- LDR Certification and/or Notification form must contain the information required in 40 CFR 268.7. EnergySolutions requires that this information be provided with each shipment of Mixed Waste or waste that has been treated to meet 40 CFR 268 treatment standards.
- Uniform Hazardous Waste Manifest must be included with the shipping paperwork for waste shipments of Mixed Waste or PCB waste that requires Mixed Waste disposal (see the WAC Technical Support Document or contact Technical Services if you are unsure). As applicable, EnergySolutions requests that shippers list the net weight on the manifest.
- Compact Export Authorization letter as applicable. If unsure, contact a Technical Services representative for additional guidance. The EnergySolutions' LLRW Export Approval procedure (Procedure CL-AD-PR-030) may be reviewed at the Customer Portal tab of the www.energysolutions.com website.

In order to provide efficiency in receiving and unloading shipments at the Clive Facility, EnergySolutions strongly requests the shipping paperwork packet be scanned and uploaded into the Customer Portal order attachments at the time the shipment leaves the customer's site.

5.3.1 Instructions for the Uniform LLRW Manifest Forms 540, 541, and 542

The NRC’s guidance document “Instructions for Completing the NRC’s Uniform Low-Level Radioactive Waste Manifest” (NUREG/BR-0204, Rev. 3, June 2020) should be used by shippers when preparing the shipping paperwork. *EnergySolutions* requires shippers to include information in both metric units and English units following the International Standard of Units (SI). Additionally, *EnergySolutions* has specific information that should also be included on the Uniform LLRW Manifest. The generator is encouraged to ensure that all isotopes listed on the NRC shipping forms have been included in the waste profile.

Form 540

- Block 5, “Shipper” must list the shipper’s company name and facility that corresponds to the Utah Generator Site Access Permit (GSAP) number. Shippers shipping on behalf of the generator and using their GSAP number should list “(shipper’s company name) on behalf of (generator’s name)”.
- Block 5, “Shipment Number” may be used by the shipper for their own tracking purposes. The “Shipment ID Number” is the unique shipment approval number (e.g., U12345) that is issued when the shipment schedule request has been approved via the Customer Portal.
- Block 8, “Manifest Number” must list the *EnergySolutions* shipment number in the following format: (XXXX-YY-ZZZZ) where XXXX is the generator number, YY is the waste stream number, and ZZZZ is the shipment number (generally starting with 0001 for the first shipment and incrementing by one for each additional shipment).
- Block 9, “Consignee” must list *EnergySolutions*’ disposal site address as shown below, contact name and telephone number. The address must specify *EnergySolutions*’ “Treatment Facility” or “Bulk Waste Facility”. List “Bulk Waste Facility” for LLRW, 11e.(2) Byproduct Material, and Mixed Waste shipped for direct disposal or list “Treatment Facility” for waste streams requiring treatment by *EnergySolutions* prior to disposal.

EnergySolutions, LLC
Clive Disposal Site – Bulk Waste Facility
Interstate 80, Exit 49
Clive, UT 84029

Form 541

- Block 6, “Container Description” specifically applies to the disposal container. For bulk shipments (e.g., gondola railcars, intermodals, etc.), list “11” for “Bulk, Unpackaged Waste” along with the bulk packaging descriptor if the bulk package does not contain other manifested packages inside. For example, a gondola railcar with a super-load wrapper would be listed as “11A” in Block 6.
- Blocks 7 and 8, “Volume” and “Waste and Container Weight” must list the gross volume and weight of the disposal container and contents. For bulk, unpackaged waste where the waste package will not be disposed (e.g., gondola railcar, intermodal, etc.), list the weight and volume of the waste. Block 9, “Waste Weight” must list the weight of the waste material only (net waste weight).
- Block 16, “Radiological Description” must also include a column for the radionuclide concentration expressed in units of pCi/g.

- Block 17, “Waste Classification” must list “AU” for Class A Unstable LLRW. Waste packages must also be labeled either “Class A Unstable” or “Class AU”. For NORM or 11e.(2) waste material, enter “N/A” since the waste classification requirements are not applicable.

Form 542

Form 542, “Manifest Index and Regional Compact Tabulation) is required for processors and collectors of LLRW who are shipping LLRW attributed to others for ultimate disposal at the Clive Facility. EnergySolutions requires that processors or collectors submitting Form 542 do so electronically using the file transfer protocol described in Section 5.3.2 of this BWF WAC due to the size of the manifest. Processors that are authorized by their license to attribute the waste to their license must submit attribution information for each shipment. Please contact a Technical Services representative for the specific format required for the attribution information.

5.3.2 Electronic Submittal of the Uniform LLRW Manifest

Generators must submit their manifests electronically in a comma-delimited file format to the Clive Facility for review and distribution. Manifests are imported directly into EnergySolutions’ waste tracking system via the Customer Portal and the manifest information is validated with initial screening checks to ensure key information is correct. The Customer Portal system provides a validation report for each validated manifest. Customer Portal also checks manifest information against the information contained in the generator’s Waste Profile (e.g., isotopes and isotope upper concentrations). Any discrepancy will be automatically flagged, allowing potential problems to be fixed well in advance of shipment arrival. The manifest validation report provides errors and warnings. Errors must be fixed prior to shipment; warnings are potential issues that should be examined prior to shipment. Shippers are responsible for making sure the information on the manifest is accurate.

Additional information regarding electronic submittal of manifests through Customer Portal can be found in the WAC Technical Support Document.

5.3.3 Signed Manifests

All manifests will be signed and returned electronically following receipt and acceptance at the BWF within 7 days of receipt date. An email will be sent to the email address(es) that are on file in the Customer Portal.

SECTION 6

PACKAGING AND TRANSPORTATION

6.1 COMPLIANCE WITH TRANSPORTATION REGULATIONS

Each shipment of waste material sent to the Clive Facility for disposal must be properly classed, described, packaged, marked, labeled, and in condition for transport as required by the Department of Transportation (DOT) Hazardous Materials Regulations (HMR) contained in 49 CFR Parts 171 through 180. Shipments of radioactive waste that are exempt from DOT regulations must be shipped to the Clive Facility in packages that prevent release of the waste during transit. Specifically, all waste packages must be secure to 1) prevent rain or snow from entering the manifested waste package and 2) prevent waste from being exposed to the environment at any time during transit. Shippers should review NRC IE Bulletin No. 79-19 for training requirements applicable to radioactive waste management.

The Clive Facility will inspect each shipment arriving at its disposal facility for compliance with the applicable licenses and/or permits including compliance with DOT HMR requirements. *EnergySolutions* will notify the generator of a non-compliant shipment and determine the best course of action to resolve the discrepancy in a safe, compliant, and timely manner.

For further instructions on Waste Packaging, please see the WAC Technical Support Document.

6.2 RELEASE OF SHIPPING CONVEYANCES

The timeframe for the release of shipping conveyances (e.g., trucks, intermodal containers, railcars, etc.) is based on the specific contractual arrangements that have been established between each generator and *EnergySolutions*. Generators must request the type of radiological release prior to the shipment's arrival and must be allowed under the Terms and Conditions of the disposal agreement. The requested release types must be authorized by *EnergySolutions*' Business Development Department. Containers released to the Unrestricted Use criteria require significantly more time and expense due to the resources needed to meet these release criteria. The Clive Facility performs the following types of radiological releases as listed in Table 6-1. Additional release criteria are available from 49 CFR 173.403 and .443(c).

Refer to the WAC Technical Support Document for more information on these radiological release criteria.

Table 6-1. Clive Facility Radiological Release Criteria

Release Type	Reference
Unrestricted Use	US NRC Regulatory Guide 1.86, June 1974 (Consistent with Clive Facility RML Condition 27)
DOT Empty	49 CFR 173.428
Sole Use	49 CFR 173.443(d)

APPENDIX A

CONTACT INFORMATION

EnergySolutions

Corporate Office: (801) 649-2000

Clive Site Security: (801) 649-2175

Technical Services:

Tim Orton, Director of Technical Services (801) 649-2144 torton@energysolutions.com

Jake Gardner, VP of Technical Services (801) 836-1555 jhgardner@energysolutions.com

Veronica Pitts, TS Customer Specialist (801) 649-2139 vpitts@energysolutions.com

Shipment Scheduling Email: scheduling@energysolutions.com

Manifest Email: manifest@energysolutions.com

EnergySolutions Website: www.energysolutions.com

Online Customer Portal: <https://customerportal.energysolutions.com>
(accessible via the main EnergySolutions website)

State of Utah

Utah Department of Environmental Quality: <https://deq.utah.gov>

Utah DWMRC Website: <https://deq.utah.gov/division-waste-management-radiation-control>

Generator Site Access Permit Telephone: (801) 536-0233

Generator Site Access Permit Website: <https://deq.utah.gov/waste-management-and-radiation-control/generator-site-access-waste-management-and-radiation-control-permits-and-permitting>

Utah DWMRC Rules: <https://deq.utah.gov/laws-and-rules/environmental-laws-and-rules>