

GENERATOR CERTIFICATION PROCESS FOR ENVIROCARE'S CONTAINERIZED CLASS A DISPOSAL FACILITY

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ABSTRACT

On October 19, 2001, the Utah Division of Radiation Control issued Amendment 12 to Radioactive Material License UT2300249 (RML) for Envirocare of Utah, Inc. (Envirocare) disposal operations. The license amendment provides the mechanism for Envirocare to receive and dispose of containerized Class A Low-Level Radioactive Waste (LLRW) at the newly constructed Containerized Waste Facility (CWF). Due to the increased radioactivity and external dose rates of waste that will be shipped to the CWF, a Generator Certification Program has been implemented that eliminates the requirement to sample incoming shipments, thus keeping worker doses to as low as reasonably achievable (ALARA).

During the Generator Certification process, the generator's radioactive waste management program is reviewed in the areas of radioactive waste characterization, packaging, and transportation for adequacy in complying with Envirocare's license conditions and waste acceptance criteria. Particular attention is given to radiological characterization, free liquid management and inspections, void space minimization procedures, QA/QC program, and recent inspection reports completed by the generator's primary radioactive waste management regulatory agency. The review and certification of a generator's radioactive waste management program includes an assessment of the required documentation and procedures. This program went into effect with the issuance of the recent license amendment and only applies to Envirocare's CWF. For receipt of bulk waste, the process of waste profiling on a waste stream basis will remain the same.

The review and certification of a generator's radioactive waste management program will include an assessment of the required documentation and procedures to the satisfaction of the Corporate Radiation Protection Manager, Quality Assurance Manager, Director of Technical Services, and Environmental Engineer. Good candidates for generator certification include facilities, such as nuclear power plants, that are directly regulated by the NRC or an Agreement State and that are licensed to handle radioactive materials up to and in excess of the Class A LLRW limits.

This paper presents the key elements of the Generator Certification Program and describes the review and approval process for certifying generators to ship waste to the CWF. Each phase of the program will be discussed to assist generators in gaining a better understanding of the certification process. Additionally, the paper will present unique differences between the CWF Waste Acceptance Criteria and the requirements from other commercial disposal facilities.

INTRODUCTION

On October 19, 2001, the Utah Division of Radiation Control issued Amendment 12 to Radioactive Material License UT2300249 (RML) for Envirocare of Utah, Inc. (Envirocare) disposal operations. The license amendment provides the mechanism for Envirocare to receive and dispose of containerized Class A Low-Level Radioactive Waste (LLRW) at the newly constructed Containerized Waste Facility (CWF). Due to the increased radioactivity and external dose rates of waste that will be shipped to the CWF, a Generator Certification Program has been implemented that eliminates the requirement to sample incoming shipments, thus keeping worker doses to as low as reasonably achievable (ALARA). This program went into effect with the issuance of the recent license amendment and only applies to Envirocare's CWF. For receipt of bulk waste, the process of waste profiling on a waste stream basis will remain the same.

For the Generator Certification Program, Envirocare reviews each generator's procedures for radioactive waste characterization, packaging, and transportation for adequacy in complying with the license conditions and waste acceptance criteria. Particular attention is given to hazardous and radiological characterization, free liquid management and inspections, void space minimization procedures, QA/QC program, and recent inspection reports completed by the generator's primary radioactive waste management regulatory agency. The review and certification of a generator's radioactive waste management program includes an assessment of the required documentation and procedures.

This paper presents the key elements of the Generator Certification Program and describes the review and approval process for certifying generators to ship waste to the CWF. Each phase of the program will be discussed to assist generators in gaining a better understanding of the certification process. Additionally, the paper will present the major differences between the CWF Waste Acceptance Criteria and the requirements from other commercial disposal facilities.

BACKGROUND

Envirocare has traditionally disposed of LLRW in constructed disposal embankments where the waste is usually removed from the container and placed in either 12 inch soil-lifts or, for larger debris, in four foot lifts using grout as illustrated in Figure 1. For such waste, incoming shipments from every waste stream are sampled to ensure the waste complies with all license conditions and that the waste is consistent with the waste profile and manifest. The RML requires that samples be collected from waste shipments at a specified frequency and analyzed for radiological and chemical properties. Additionally, the RML requires the generator to complete and submit a waste profile for each waste stream with analytical data supporting the waste classification relative to the chemical and radiological properties.

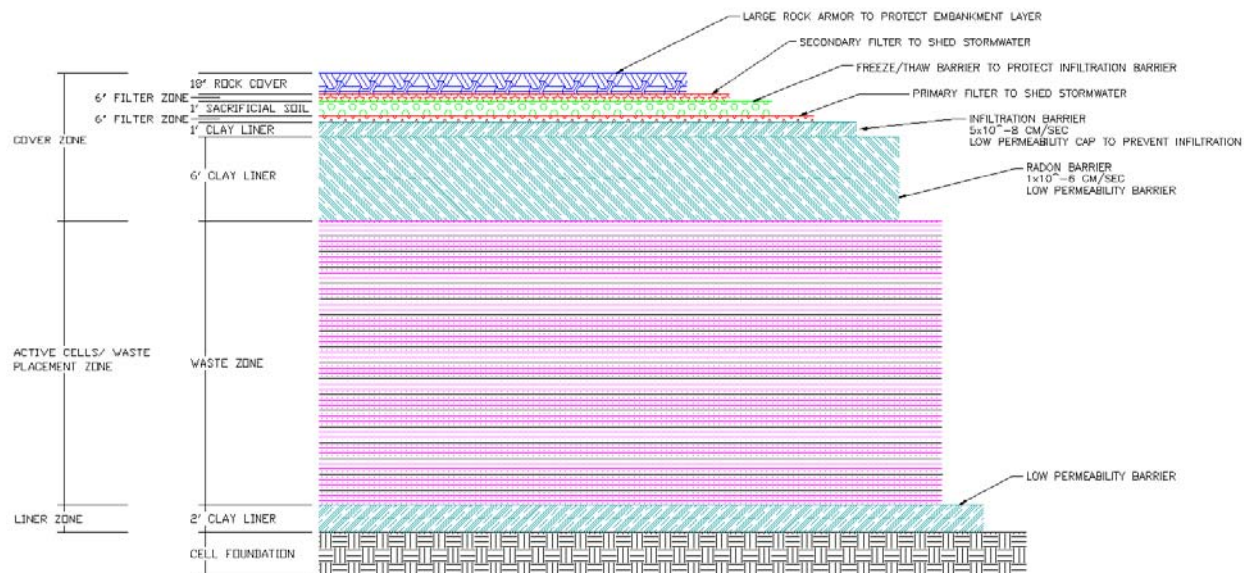


Fig. 1. Cross section of soil-lift disposal embankment.

Because the waste is sampled and removed from the shipping container in these cases, each waste stream is evaluated to determine how the waste will be most safely and efficiently managed for disposal in order to keep worker doses to ALARA. Envirocare has been able to minimize radiological exposure to workers as a result of the waste profiling process. The average annual worker dose for year 2000 at Envirocare was less than 15 mrem.

Early in 2000, Envirocare requested a license amendment from the Utah DRC in order to receive and dispose of full Class A waste at the proposed CWF without being required to sample incoming shipments or removing the waste from the container for ALARA reasons. Envirocare proposed to modify the traditional waste profiling process for waste streams destined for disposal at the CWF by focusing more on the generator's radioactive waste management program and procedures. The proposed Generator Certification Program was implemented with the issuance of RML Amendment 12.

In anticipation of the license amendment being issued by the Utah DRC, Envirocare established a contact dose rate limit on shipping containers of 200 mR/hr for waste that would continue to be managed using the traditional disposal methods of removing the waste from the container. Containers of waste with contact dose rates exceeding 200 mR/hr are required to be disposed of at the CWF unless approved by Envirocare for management as bulk waste. Expected contact dose rates on packages shipped to the CWF range from 200 mR/hr up to 200 R/hr with the majority being less than 20 R/hr. The disposal operations at the CWF allow for the direct disposal of the higher activity containerized waste thus minimizing the radiological exposures to workers.

As illustrated in Figure 2, the CWF is located within the footprint of the Class A disposal embankment. The CWF cell is 300' by 300' and allows for the disposal of approximately 400,000 ft³ of containerized waste. Additional cell space will be constructed as the current CWF cell is filled with containerized Class A waste. Disposal containers such as High Integrity Containers (HICs) or liners are placed in concrete caissons to provide shielding and also to optimize cell efficiency. Most shipments to the CWF will consist of HICs or liners shipped in casks.

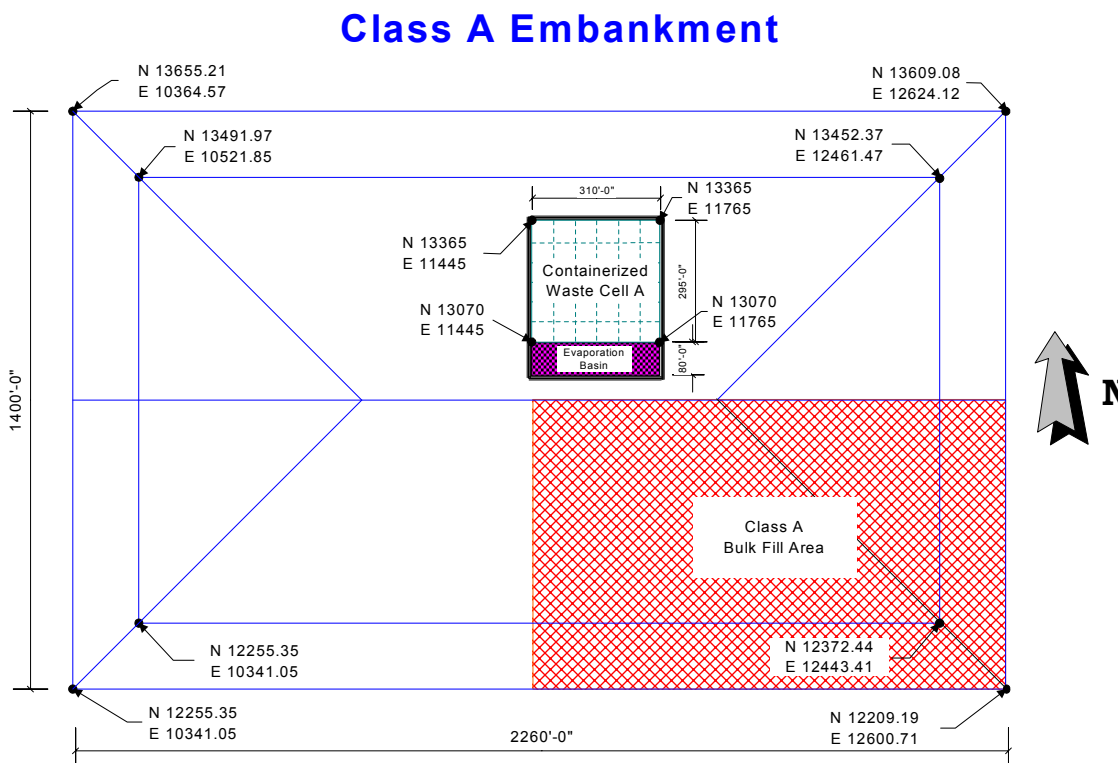


Fig. 2. Containerized Waste Facility footprint within the Class A disposal embankment.

GENERATOR CERTIFICATION PROGRAM

Generators desiring to become certified to ship waste to Envirocare's CWF must 1) become thoroughly familiar with the conditions in the RML and Containerized Waste Facility Waste Acceptance Criteria (CWF WAC); 2) ensure that their radioactive waste management program is compliant with the RML and CWF WAC by revising all applicable procedures used to ship waste to Envirocare's CWF (e.g., characterization, classification, packaging, transportation, etc.); and 3) submit the revised procedures and documentation to Envirocare for review. After Envirocare reviews the required documentation and certifies the generator to ship waste to the CWF, a Notice to Transport will be issued authorizing shipments of the waste types identified

during the certification process. This sections details the steps for a generator to become certified by Envirocare.

Step One

The first step in the Generator Certification Program is to obtain copies of the Radioactive Material License UT2300249, CWF WAC, and Certified Containerized Waste Profile Record (profile). These documents are available from Envirocare's website at www.envirocareutah.com or by requesting a CD-ROM containing the documents from one of Envirocare's Business Development representatives. The CWF WAC is a formal procedure that incorporates the RML conditions and provides the necessary details for a generator to schedule and ship waste to Envirocare's CWF. Most of the RML and CWF WAC conditions are derived from federal and state regulations governing the management of LLRW. Conditions in the RML and CWF WAC that are unique to Envirocare's CWF are listed below. Since these conditions are unique to shipping waste to Envirocare, generator's procedures related to these requirements should be revised as necessary.

- Voids - Per License Condition 16.M and Section 6.4.4 of the CWF WAC, all waste containers must be filled to the maximum extent practical, but in no case shall the voids within the package exceed 15 percent of the container internal volume. Voids are defined as the spaces within the waste and between the waste and its packaging. This condition is required for all waste shipped to the CWF. Generators must incorporate this condition into their operating procedures. Variances to this condition are subject to a case-by-case review by Envirocare and approval of the Executive Secretary of the Utah Department of Radiological Control (DRC).
- Waste Classification - Per License Condition 16.L and Section 6.4 of the CWF WAC, all shipments received at the CWF must be properly classified and marked in accordance with Utah Administrative Code (UAC) R313-15-1008, the NRC Branch Technical Position on Radioactive Waste Classification, as amended and the NRC Branch Technical Position on Concentration Averaging and Encapsulation, as amended. Note that UAC R313-15-1008 is essentially equivalent to 10 CFR 61.55-57 except radium-226 has been added as a Table 1 isotope in determining waste classification. Generators must incorporate this reference into their classification procedures.
- Resins - Per License Condition 37 and Section 6.11.12 of the CWF WAC, resins must be disposed in HICs or liners meeting the void space criteria. HICs that are not Utah-DRC approved (package is not intended to provide stability per R313-15-1008) will be managed as a liner for disposal purposes.
- Special Nuclear Material (SNM) - Per License Condition 13.J and Section 6.11.9 of the CWF WAC, the maximum amount of SNM that Envirocare's CWF may possess, undisposed of at any one time, must not exceed 350 grams U-235, 200 grams U-233 and 200 grams Plutonium, or any combination of them in accordance with "sum-of-fractions" calculation identified in the cited references. This is different from Envirocare's Bulk

Waste Facility, which still operates under the NRC's SNM Exemption Order (concentration based limits) prescribed in License Condition 13.

- Mixed Waste - Per License Condition 14 and Section 6.11.15, Hazardous waste as defined by RCRA, including characteristic or listed wastes, are prohibited from disposal at the CWF. Characteristic hazardous waste, which has been treated to remove the characteristic, is prohibited from disposal at the CWF.
- Liquid Radioactive Waste - Per Sections 6.11.4 and 6.11.5 of the CWF WAC, liquid radioactive waste must be solidified with a Utah DRC-approved solidification agent with no liquid exceeding 0.5 percent of the volume of solidified waste. The waste must contain as little free-standing and non-corrosive liquid as is reasonably achievable. Absorbent may be placed in packages of dry, solid waste to absorb unintentional and incidental amounts of liquids. Solid waste containing liquid shall contain as little free-standing and non-corrosive liquid as is reasonably achievable, but in no case shall the liquid exceed one percent of the waste volume.
- Uniform LLRW Manifest - Per Section 6.3 of the CWF WAC, the Uniform LLRW manifest must incorporate the specified items that are unique to Envirocare. Procedures related to Radioactive Waste Shipping/Transportation should include the steps specified in Section 6 of the CWF WAC (e.g., advanced shipment notification, departure notification, advanced manifesting, etc.).
- Radiological Survey for Cask Shipments – Per Section 6.7.11 of the CWF WAC, radiological surveys of a cask shipment must include the maximum general area dose rate even with the top center plane of the open cask. The radiological survey documentation must be included with the shipping paperwork.
- Generator Site Access Permit – Per Section 6.3 of the CWF WAC and UAC R313-26, generators are required to obtain a Generator Site Access Permit from the Utah DRC before shipping waste to Envirocare. The permit number must be listed on the manifest under Block 5 of Form 540. Generators may apply for the permit or obtain additional information from the Utah DRC's website at www.deq.state.ut.us/eqrad/drc_prmt.htm.

Step Two

The next step in the certification process is to revise applicable procedures as necessary to address the conditions specified in the RML and CWF WAC. The following procedures (or equivalent) should be reviewed to ensure changes are made as necessary.

- Quality Assurance Program
- Process Control Program, if applicable
- Training Program

- 10 CFR 61 Sampling and Analysis Program
- Radioactive Waste Characterization/Classification
- Radioactive Waste Packaging
- Radioactive Waste Processing (e.g., dewatering procedure for resins)
- Radioactive Waste Shipping
- Liquid Verification

Envirocare recommends the generator submit draft copies for review of any revised procedures prior to making them official. Allowing Envirocare to comment on draft revisions will reduce the amount of time for each generator to become certified.

Step Three

After all necessary procedures have been revised, the next step is to submit the requested procedures to Envirocare for review. In addition to the procedures (or equivalent) listed above, Envirocare also requests the generator submit the following documents/information:

- Certified Containerized Waste Profile Record – This form is available on Envirocare's website. The generator must complete this form and submit it with the requested procedures identified in Section 4 of the form.
- Audit/Inspection Reports – The last three audits/inspection reports from the generator's regulatory agency (or equivalent). Generator responses and corrective actions relative to any findings or infractions must be included with the report.

Envirocare will review each generator's procedures for radioactive waste characterization, packaging, and transportation for adequacy in complying with the RML conditions and CWF WAC. Particular attention will be given to radiological characterization, free liquid management and inspections, void space minimization procedures, QA/QC program, and recent inspection reports completed by the generator's primary radioactive waste management regulatory agency. Envirocare's review and certification of a generator's radioactive waste management program will include an assessment of the required documentation and procedures to the satisfaction of the Corporate Radiation Protection Manager, Quality Assurance Manager, Director of Technical Services, and Environmental Engineer.

Step Four

Upon successful completion of the Generator Certification Program, a Notice to Transport will be issued to the generator authorizing shipments of containerized Class A waste to the CWF. As shown in Figure 3, the Notice to Transport will identify the approved waste types approved as



Notice to Transport

Containerized Waste Facility

EC-98243, Revision 0

Envirocare has reviewed the Certified Containerized Waste Profile Record (EC-98210) and the supporting documentation. Based on our review of the information and certifications provided, Envirocare hereby issues notice that the following generator is certified to ship waste to Envirocare's Containerized Waste Facility. **This Notice to Transport is valid for one year from date of issuance.** Envirocare may renew the Notice to Transport annually upon receipt and approval of an updated Certified Containerized Waste Profile Record.

All waste shipments must be packaged and transported in accordance with the Radioactive Material License UT 2300249 (RML), State and Federal regulations, Envirocare's "Containerized Waste Facility Waste Acceptance Criteria" (Procedure TSC-2.0), and a signed Disposal Agreement. Envirocare may inspect individual waste containers upon receipt to determine compliance with the RML. Treated characteristic or listed hazardous waste, as defined in 40 CFR 261, is prohibited from disposal at the Containerized Waste Facility.

Generator Name / Waste Location

Generator Number

Contractor Name

Utah Site Access Permit

Certified Waste Types:

- | | |
|--|---|
| <input type="checkbox"/> Dry Active Waste | <input type="checkbox"/> Soil/soil-like material |
| <input type="checkbox"/> Resins | <input type="checkbox"/> Evaporator bottoms/sludges/ concentrates |
| <input type="checkbox"/> Filters | <input type="checkbox"/> Solidified liquids |
| <input type="checkbox"/> Treated biological, pathogenic, or infectious materials | <input type="checkbox"/> Incinerator ash |

Other: _____

Director of Technical Services

Date

Fig. 3. Containerized Waste Facility Notice to Transport

part of the certification process. The Notice to Transport is valid for one year from date of issuance. Envirocare may renew the Notice to Transport upon receipt and approval of a updated Certified Containerized Waste Profile Record.

Generators may revise the profile form to include additional waste types at any time. Envirocare may request procedures addressing the additional waste types if these procedures were not reviewed during the previous certification process.

CONCLUSION

With the issuance of Amendment 12 to the RML, Envirocare can now accept full Class A waste at the newly constructed Containerized Waste Facility. The Generator Certification Program was implemented to allow Envirocare a mechanism to accept waste shipments without having to perform verification sampling upon receipt as is required with waste received and managed in bulk form. Instead of the traditional waste profiling process, the Generator Certification Program focuses on the generator's Radioactive Waste Management Program and allows Envirocare the opportunity to evaluate the generator's program in order to certify them to ship containerized Class A waste to the CWF. This paper presented the necessary steps for a generator to become certified.