



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Ref: SA/KNS

SEP 12 1983

WM Record File

WM Project 8

Docket No. _____

PDR

LPDR _____

MEMORANDUM FOR: Leo Higginbotham, Chief Distribution:
Low-Level Waste Licensing LH
Branch, NMSS

EILEEN TICKET

(Return to WM, 623-SS)

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William J. Olmstead
Regulation Division Director and
Chief Counsel, OELD

FROM: Donald A. Nussbaumer
Assistant Director for
State Agreements Program
Office of State Programs

SUBJECT: NEVADA DRAFT REGULATIONS

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WM DOCKET CONTROL
CENTER

Enclosed for your review and comments are Nevada's draft regulations for implementing the waste classification system and the waste manifest and transfer requirements. A response by October 12, 1983 would be appreciated.

Donald A. Nussbaumer
Donald A. Nussbaumer
Assistant Director for
State Agreements Program
Office of State Programs

Enclosure:
As stated

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before January, 1983
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459.361 Transfer of Radioactive Waste for Disposal by Burial.

1. Each shipment of radioactive waste to a licensed land disposal area must be accompanied by a shipment manifest that contains the name, address, and telephone number of the person generating the waste. The manifest shall also include the name, address, and telephone number or the name and EPA hazardous waste identification number of the person transporting the waste to the land disposal area. The manifest must also indicate as completely as practicable: a physical description of the waste; the waste volume; radionuclide identity and quantity; the total radioactivity; and the principal chemical form. The solidification agent must be specified. Wastes containing more than 0.1% chelating agents by weight must be identified and the weight percentage of the chelating agent estimated. Wastes classified as Class A, Class B, or Class C in subsection 8 must be clearly identified as such in the manifest. The total quantity of the radionuclides H-3, C-14, Tc-99 and I-129 must be shown. The manifest required by this paragraph may be shipping papers used to meet Department of Transportation or Environmental Protection Agency regulations or requirements of the receiver, provided all the required information is included.

2. Each manifest must include a certification by the waste generator that the transported materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transporting according to the applicable regulations of the Department of Transportation and the division. An authorized representative of the waste generator shall sign and date the manifest.

3. Any licensee who generates and transfers radioactive waste to a land disposal area or to a broker who collects waste shall comply with all of the requirements of

the section. Any licensee who generates and transfers waste to a broker who processes, treats or repackages waste shall comply with the requirements of subsection 3(d) through (h). A licensee shall:

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(a) Prepare all wastes so that the waste is classified according to subsection 8 and meets the waste characteristics requirements in subsection 9;

(b) Label each package of waste to identify whether it is Class A waste, Class B waste, or Class C waste, in accordance with subsection 8 of this section;

(c) Conduct a quality control program to assure compliance with subsection 8 and subsection 9 of this section; the program must include management evaluation of audits;

(d) Prepare shipping manifests to meet the requirements of subsection 1 and subsection 2;

(e) Forward a copy of the manifest to the intended recipient, at the time of shipment; or, deliver to a broker at the time the waste is collected, obtaining acknowledgement of receipt in the form of a signed copy of the manifest from the broker;

(f) Include a copy of the manifest with the shipment;

(g) Retain a copy of the manifest with documentation of acknowledgement of receipt as the record of transfer of licensed material;

(h) For any shipments or any part of a shipment for which acknowledgement of receipt has not been received within twenty days after the shipping date, conduct an investigation in accordance with subsection 7.

4. Any broker who collects and handles only prepackaged waste shall:

(a) Acknowledge receipt of the waste from the licensee who generated the waste within one week of receipt by returning a signed copy of the manifest;

(b) Prepare a new manifest to reflect consolidated shipments; the new manifest shall serve as a listing or index for the detailed original manifests. Copies of the original manifests shall be a part of the new manifest. The broker may prepare a new manifest without attaching the original manifests, provided the new manifest contains for each package the information specified in subsection 1. The broker shall certify that nothing has been done to the waste which would invalidate the certifications of the licensees who generated the waste;

(c) Forward a copy of the new manifest to the land disposal area operator at the time of shipment;

(d) Include the new manifest with the shipment to the disposal area;

(e) Retain a copy of the manifest with documentation of acknowledgement of receipt as the record of transfer of licensed material, and retain information from the original manifests until disposition is authorized by the division; and,

(f) For any shipments or any part of a shipment for which acknowledgement of receipt is not received within twenty days after the shipping date, conduct an investigation in accordance with subsection 7.

5. Any broker who processes, treats or repackages wastes shall:

(a) Acknowledge receipt of the waste from the licensee who generated the waste within one week of receipt by returning a signed copy of the manifest;

(b) Prepare a new manifest that meets the requirements of subsection 1 and 2. Preparation of the new manifest is acknowledgement that the processor is responsible for the waste;

(c) Prepare all wastes so that the waste is classified according to subsection 8 and meets the waste characteristics requirement in subsection 9;

(d) Label each package of waste to identify whether it is Class A waste, Class B waste, or Class C waste, in accordance with subsections 8 and 10.

(e) A quality control program shall be conducted by the broker to assure compliance with subsections 8 and 9. The program must include management evaluation of audits;

(f) Forward a copy of the new manifest to the disposal area operator or broker who collected the waste at the time of shipment, or deliver to a broker at the time the waste is collected, obtaining acknowledgement of receipt in the form of a signed copy of the manifest by the broker;

(g) Include the new manifest with the shipment;

(h) Retain copies of original manifests and new manifests with documentation of acknowledgement of receipt as the record of transfer of licensed material required by subsection 2 of NAC 459.364;

(i) For any shipment or part of a shipment for which acknowledgement is not received within twenty days after the shipping date, conduct an investigation in accordance with subsection 7.

6. The land disposal area operator shall:

(a) Acknowledge receipt of the waste within one week of receipt by returning a signed copy of the manifest to the shipper. The shipper to be notified is the licensee who last possessed the waste and transferred the waste to the operator. The returned copy of the manifest shall indicate any discrepancies between materials listed on the manifest and materials received;

(b) Maintain copies of all completed manifests until the division authorizes their disposition; and

(c) Notify the shipper and the division when any shipment or part of a shipment has not arrived within 30 days after the advance manifest was received;

(d) Notify the division within 5 days of any discrepancies between materials listed on the manifest and materials received.

7. Any shipment or part of a shipment for which acknowledgement is not received from the broker who collects waste, broker who processes waste or disposal area operator must:

(a) Be investigated by the shipper if the shipper has not received notification of receipt within twenty days after shipping date; and,

(b) Be traced and reported. The investigation must include tracing the shipment and filing a report with the division. Each licensee who conducts a trace investigation shall file a written report with the division within 2 weeks of completion of the investigation;

(c) The shipper must notify the division at the start of the investigation.

8. Waste Classification.

(a) Classes of waste.

(1) The physical form and characteristics of Class A waste must meet the minimum requirements set forth in subsection 9(a). Class A waste must be segregated from other waste classes unless it meets the stability requirements set forth in subsection 9(b) in which case it does not have to be segregated.

(2) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in subsection 9.

(3) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal area to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in subsection 9.

(4) Waste that is not acceptable for near-surface disposal is waste for which waste form and disposal methods must be different, and in general more stringent, than those specified for Class C waste. In the absence of specific requirements in this part, proposals for disposal of this waste may be submitted to the division for approval prior to transfer for disposal.

(b) Classification determined by long-lived radionuclides. If radioactive waste contains only radionuclides listed in Table 1, classification shall be determined as follows:

Table 1

<u>Radionuclide</u>	<u>Concentration curies/cubic meter</u>
<u>C-14</u>	<u>8</u>
<u>C-14 in activated metal</u>	<u>80</u>
<u>Ni-59 in activated metal</u>	<u>220</u>
<u>Nb-94 in activated metal</u>	<u>0.2</u>
<u>Tc-99</u>	<u>3</u>
<u>I 129</u>	<u>0.08</u>
<u>Alpha emitting transuranic nuclides with half-life greater than five years</u>	<u>100*</u>
<u>Pu-241</u>	<u>3,500*</u>
<u>Cm-242</u>	<u>20,000*</u>

* Units are nanocuries per gram

(1) If the concentration does not exceed 0.1 times the value in Table 1, the waste is Class A;

(2) If the concentration exceeds 0.1 times the value in Table 1, the waste is Class C;

(3) If the concentration exceeds the value in Table 1, the waste is not acceptable for near-surface disposal;

(4) For wastes containing mixtures of radionuclides listed in Table 1, the total concentration shall be determined by the sum of fractions rule described in subsection 8(f).

(c) Classification determined by short-lived radionuclides. If radioactive waste does not contain any of the radionuclides listed in Table 1, classification shall be determined based on the concentrations shown in Table 2. If a nuclide is not listed in Table 2, it does not need to be considered in determining the waste class.

Table 2

<u>Radionuclide</u>	<u>Concentration, curies/cubic meter</u>		
	<u>Column 1</u>	<u>Column 2</u>	<u>Column 3</u>
<u>Total of all nuclides with less than 5 year half life</u>	<u>700</u>	<u>**</u>	<u>**</u>
<u>H-3</u>	<u>40</u>	<u>**</u>	<u>**</u>
<u>Co-60</u>	<u>700</u>	<u>**</u>	<u>**</u>
<u>Ni-63</u>	<u>3.5</u>	<u>70</u>	<u>700</u>
<u>Ni-63 in activated metal</u>	<u>35</u>	<u>700</u>	<u>7000</u>
<u>Sr-90</u>	<u>0.04</u>	<u>150</u>	<u>7000</u>
<u>Cs-137</u>	<u>1</u>	<u>44</u>	<u>4600</u>

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

(1) If the concentration does not exceed the value in Column 1, the waste is Class A;

(2) If the concentration exceeds the value in Column 1, but does not exceed the value in Column 2, the waste is Class B;

(3) If the concentration exceeds the value in Column 2, but does not exceed the value in Column 3, the waste is Class C;

(4) If the concentration exceeds the value in Column 3, the waste is not acceptable for near-surface disposal;

(5) For wastes containing mixtures of the nuclides listed in Table 2, the total concentration shall be determined by the sum of fractions rule described in subsection 8(f).

(d) Classification determined by both long- and short-lived radionuclides. If radioactive waste contains a mixture of radionuclides, some of which are listed in Table 1, and some of which are listed in Table 2, classification shall be determined as follows:

(1) If the concentration of a nuclide listed in Table 1 is less than 0.1 times the value listed in Table 1, the class shall be that determined by the concentration of nuclides listed in Table 2;

(2) If the concentration of a nuclide listed in Table 1 exceeds 0.1 times the value listed in Table 1, the waste shall be Class C, provided the concentration of nuclides listed in Table 2 does not exceed the value shown in Column 3 of Table 2.

(e) Classification of wastes with radionuclides other than those listed in Table 1 and 2. If radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A;

(f) The sum of the fractions rule for mixtures of radionuclides. For determining classification for waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each nuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits must all be taken from the same column of the same table. The sum of the fractions for the column must be less than 1.0 if the waste class is to be determined by that column. Example: A waste contains Sr-90 in a concentration of 50 Ci/m³ and Cs-137 in a concentration of 22 Ci/m³. Since the concentration both exceed the values in Column 1, Table 2, they must be compared to Column 2 values. For Sr-90 fraction, 50/150 = 0.33; for Cs-137 fraction, 22/44 = 0.5; the sum of the fractions = 0.83. Since the sum is less than 1.0, the waste is Class B;

(g) Determination of concentrations in wastes. The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram.

9. Radioactive Waste Characteristics.

(a) The following requirements are minimum requirements for all classes of waste.

(1) Radioactive wastes must be packaged in conformance with the conditions of the license issued to the waste disposal area operator to which the waste will be shipped. Where the conditions of the waste disposal area license are more restrictive than the provisions of these regulations, the waste disposal area license conditions shall govern;

(2) Wastes must not be packaged for disposal in cardboard or fiberboard boxes;

(3) Liquid waste must be packaged in sufficient absorbent material to absorb twice the volume of the liquid;

(4) Solid wastes containing liquid shall contain as little free standing and non corrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume;

(5) Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water;

(6) Waste must not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged in accordance with subsection 9(a)(8).

(7) Wastes must not be pyrophoric. Pyrophoric materials contained in wastes shall be treated, prepared, and packaged to be nonflammable;

(8) Wastes in a gaseous form must be packaged at a pressure that does not exceed 1.5 atmospheres at 20°C. Total activity must not exceed 100 curies per container;

(9) Wastes containing hazardous, biological, pathogenic, or infectious material must be treated to reduce to the maximum extent practicable the potential hazard from the non-radiological materials.

(b) Stability Requirements for Waste.

(1) Waste must have structural stability and generally maintain its physical dimensions and its form, under the expected disposal conditions and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself, processing the waste to a stable form, or by placing the waste in a disposal container or structure that provides stability after disposal;

(2) Liquid wastes, or waste containing liquid, must be converted into a form that contains as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of the waste for waste processed to a stable form;

(3) Void spaces within the waste and between the waste and its package must be reduced to the extent practicable.

10. Labeling of Radioactive Waste Packages.

The licensee shall label each package of waste to identify whether it is Class A waste, Class B waste, or Class C waste, in accordance with subsection 8.