

Instructions To Customers For Packaging, Labeling
And Transportation of Radioactive Materials For
Disposal.

1. Customer Responsibility

You, and only you, as generator of the materials have first hand knowledge of what goes into a package and the proper packaging thereof. Therefore, it is imperative that you keep accurate records of these materials regarding each radioisotope and quantity contained therein, but also you must describe the physical contents of the package. For example, is the package filled only with counting vials, animal carcasses or dry solid wastes? (For the burial sites all waste types must be separated). Have there been any bottles of liquids other than counting vials placed in any containers? If there have been, this is not allowed. No free liquids, other than in scintillation vials are acceptable.

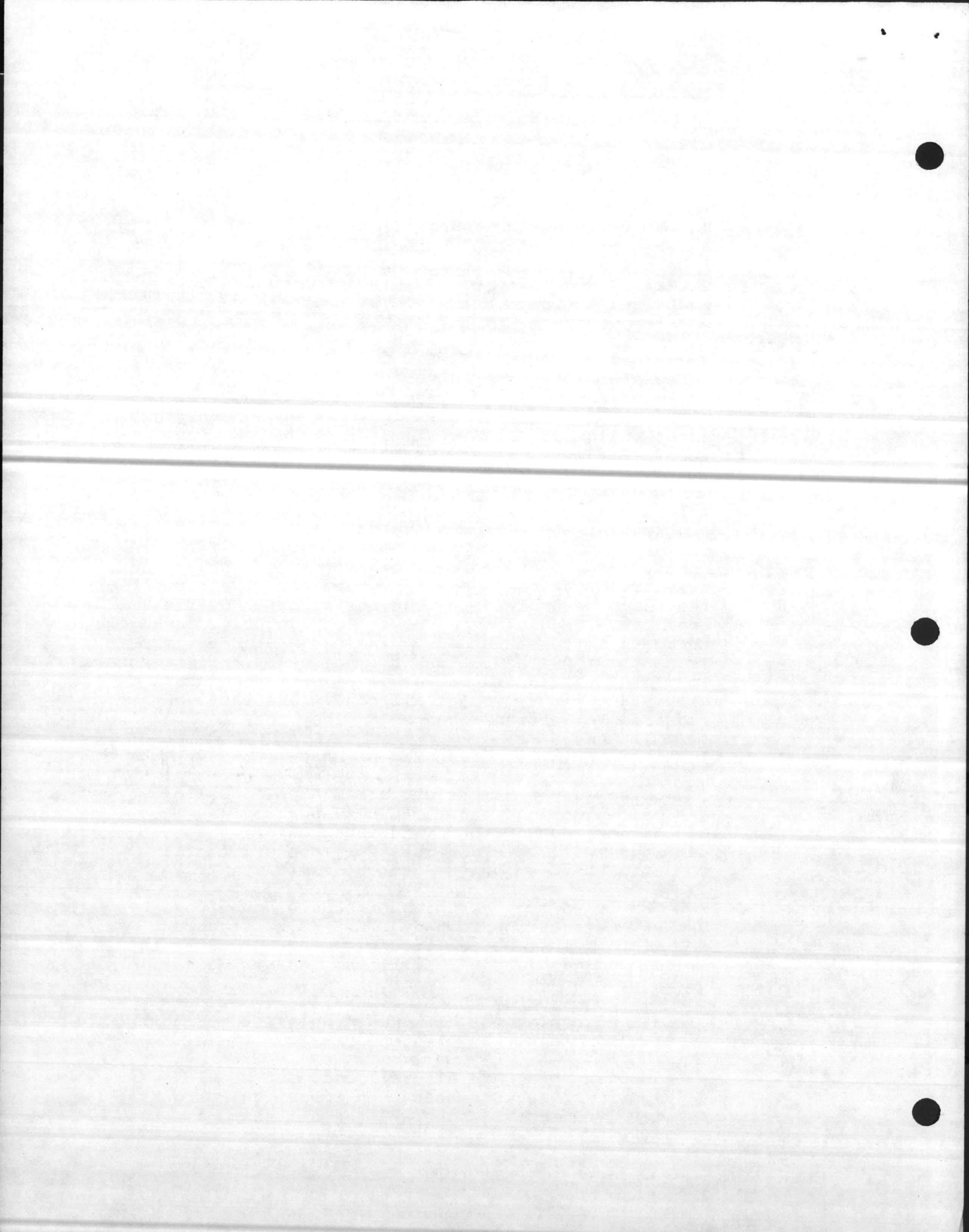
Also, you must bear in mind the various rules and regulations that must be complied with. These include your own licensing conditions, the licensing conditions of your current pickup vendor, Department of Transportation regulations, and any other conditions that have been placed on the burial sites by the applicable regulatory agency. Consequently, packaging to one set of standards such as the U.S. Department of Transportation regulations are not necessarily adequate to meet the standards at a burial site. We shall attempt to inform you of all conditions that you are required to meet and changes as they occur.

2. Types of Containers That May Be Used

Steel drums of various sizes (i.e. 5 Gallon 30 Gallon, 55 Gallon, etc.) may be used provided they are new or reconditioned and in excellent shape so that they will, without question, conform to the condition of a strong tight container.

Enclosed are packaging procedures published by Nuclear Engineering Company, Inc. (See Attachment No. 1) that must be complied with for burial at the Nevada and Washington facilities. As stated earlier, these procedures are more specific and restrictive than is required by the U.S. Department of Transportation regulations, but nevertheless they must be adhered to exactly as printed.

Wooden boxes are also allowed, but should only be used in those instances when large, bulky objects are involved that do not lend themselves to a



standard steel drum. When wooden boxes are used, extreme care should be taken to be absolutely certain that all cracks are sealed with a materials such as caulking compound to assure that no leakage can occur. In addition, all objects that are placed in a wooden box should be securely wrapped in plastic and sealed with tape or some equivalent method. Boxes must also be adequately banded with steel bands.

For each package, whether it be a steel drum or wooden box, the smallest outside dimension must be 4 inches or greater. Each package must be of such integrity either for shielding efficiency or leak tightness, so that, under conditions normally incident to transportation, there will be no release of radioactive material. This means then, that all packages of radioactive materials must be so designed and packaged to withstand a trip of hundreds of miles enroute to a burial site.

What this means to you as the generator/packager is that you have the responsibility for each of your packages until they reach the burial site and are accepted for burial.

3. Marking and Labeling

LSA (low specific activity) radioactive materials which are transported as exclusive use are exempt from specification packaging, marking, and labeling. The words "Radioactive LSA" must be stenciled or otherwise marked on each package.

LSA Label

provided by SWN →

**RADIOACTIVE
L.S.A.**

Date _____

Millicuries _____

Isotope _____

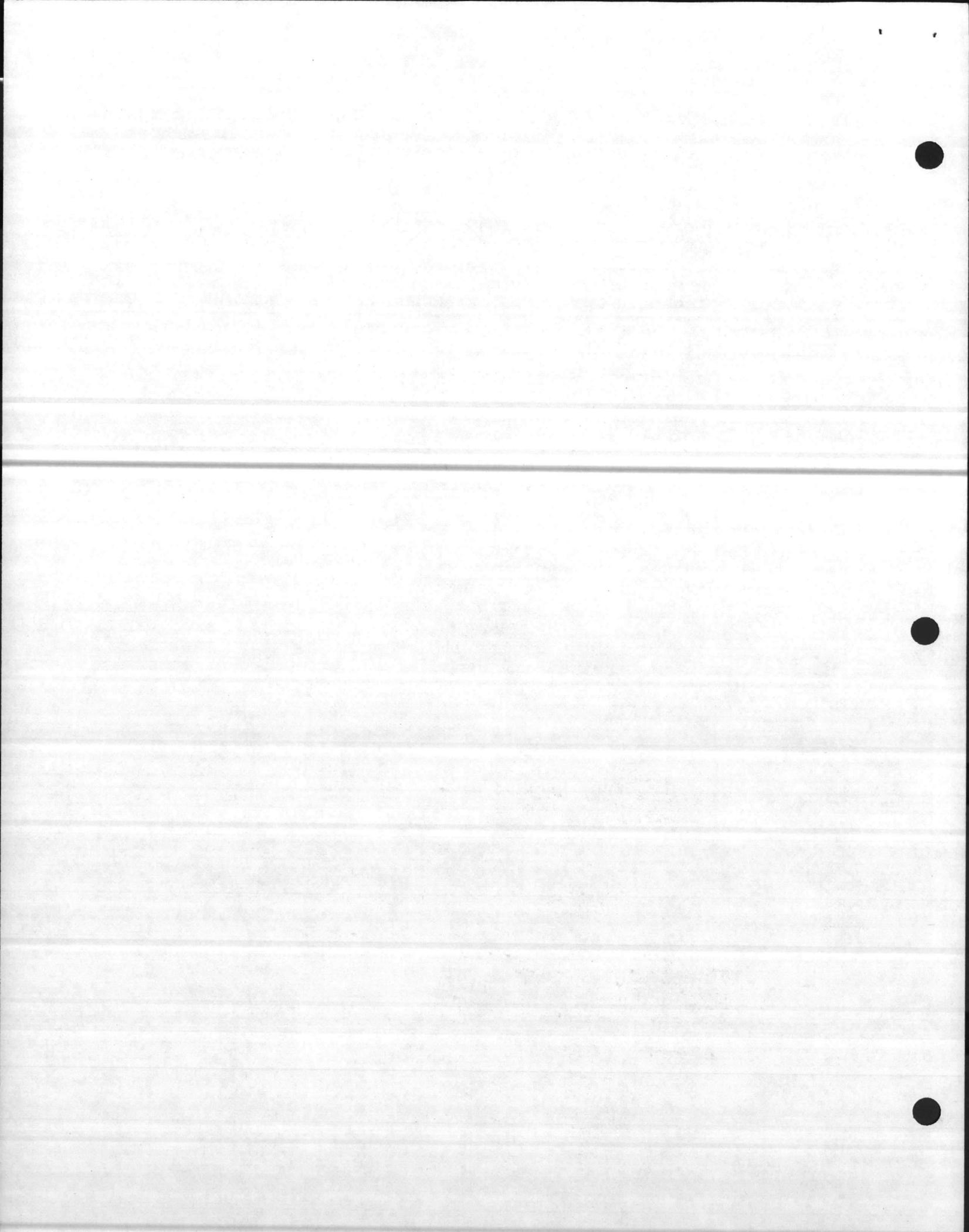
MR/hr @ Surface _____

MR/hr @ Meter _____

Source Lbs. _____

S.N.M. Grams _____

Customer _____

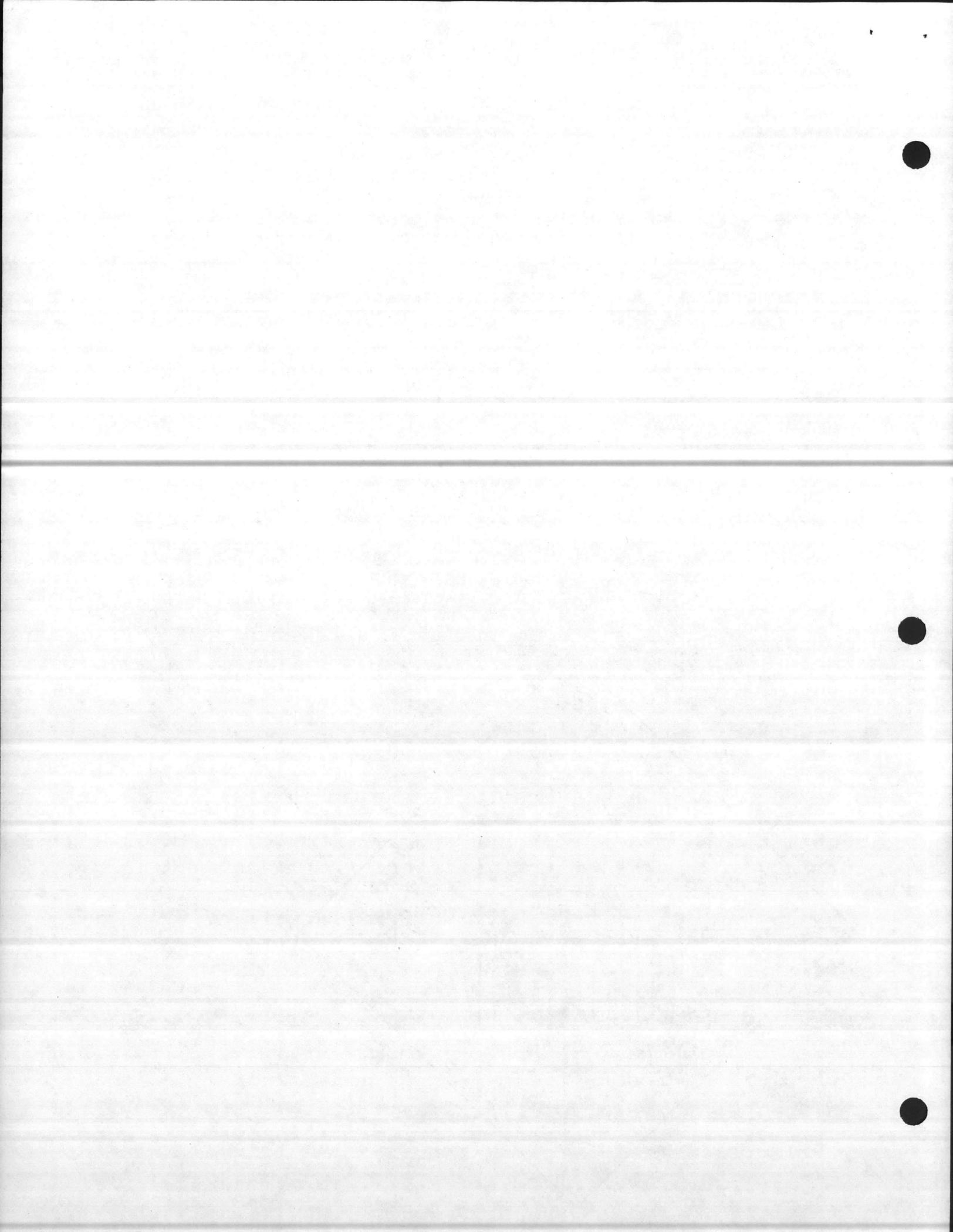


However, SouthWest Nuclear Company does require the following marking and labeling on all packages received by the company from all generator/packagers.

- a. Each package shall have a label that indicates each radioisotope contained therein and the respective activity of each radioisotope. This information must coincide exactly with the entry for that package on the Radioactive Shipment Record Form.
- b. Each package shall have the name and address of the generator/packager clearly and legibly written or printed on the package in such a way so as to be relatively permanent which cannot be easily rubbed off or rendered unreadable by such things as rain or wind.
- c. Each package shall have coded number clearly and legibly written or printed upon the outside and this number shall be entered on the Radioactive Shipment Record Form.
- d. All packages that do not meet the requirements for Low Specific Activity must have a Radioactive White I, Radioactive Yellow II, or Radioactive Yellow III label attached as described below:

Radioactive White I



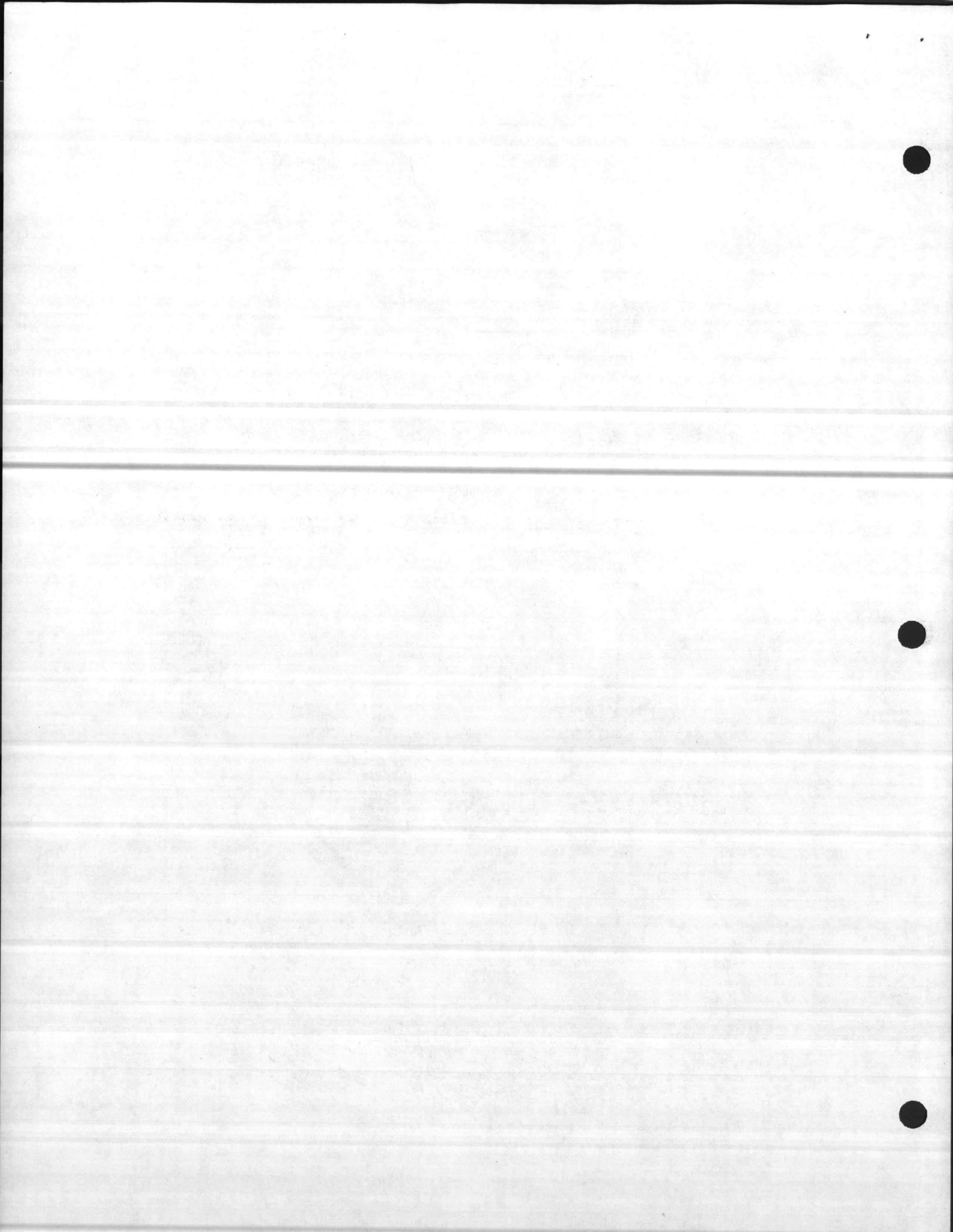


1. A Radioactive White I label must be affixed to each package measuring 0.5 millirem or less per hour at each point on the external surface of the package, provided the package is not a Fissile Class II or III or does not contain a "large quantity" of radioactive material as defined in paragraph 173.389 of the Hazardous Materials Regulations of the Department of Transportation.

Radioactive Yellow II



2. A Radioactive Yellow II label must be affixed to each package measuring more than 0.5 but less than 50 millirem per hour at each point, and not exceeding 1.0 millirem per hour at three feet from each point on the external surface of the package, and on

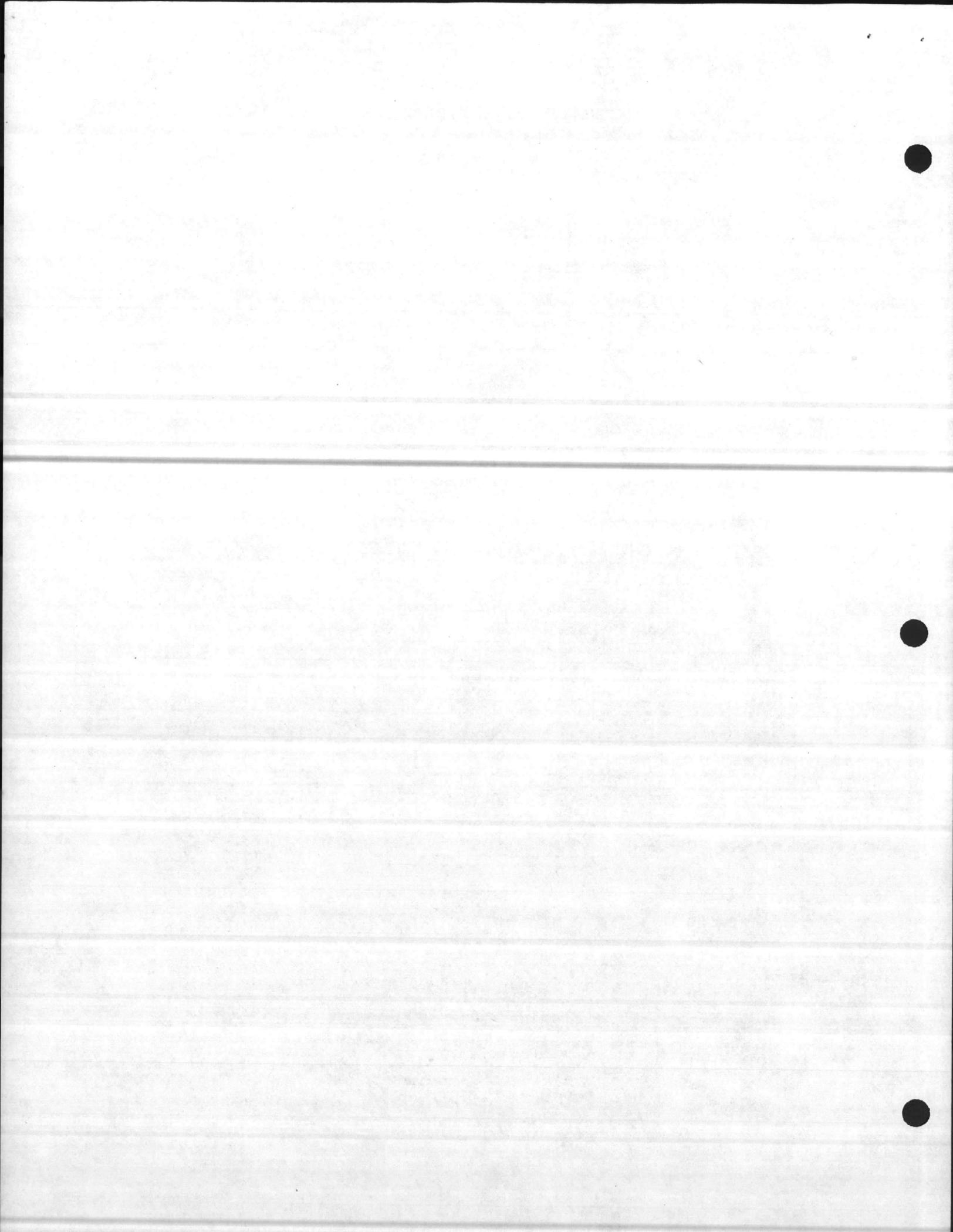


a Fissile Class II package having a transport index of 1.0 or less.

Radioactive Yellow III



3. A Radioactive Yellow III label must be affixed to each package which measures more than 50 millirem per hour at each point, or exceeds 1.0 millirem per hour at three feet from each point on the external surface, or a Fissile Class III or contains a "large quantity" of radioactive material as defined in paragraph 173.389 of the Hazardous Materials Regulations of the Department of Transportation.



4. Each package requiring a Radioactive label must have two of these labels affixed to opposite sides of the package.

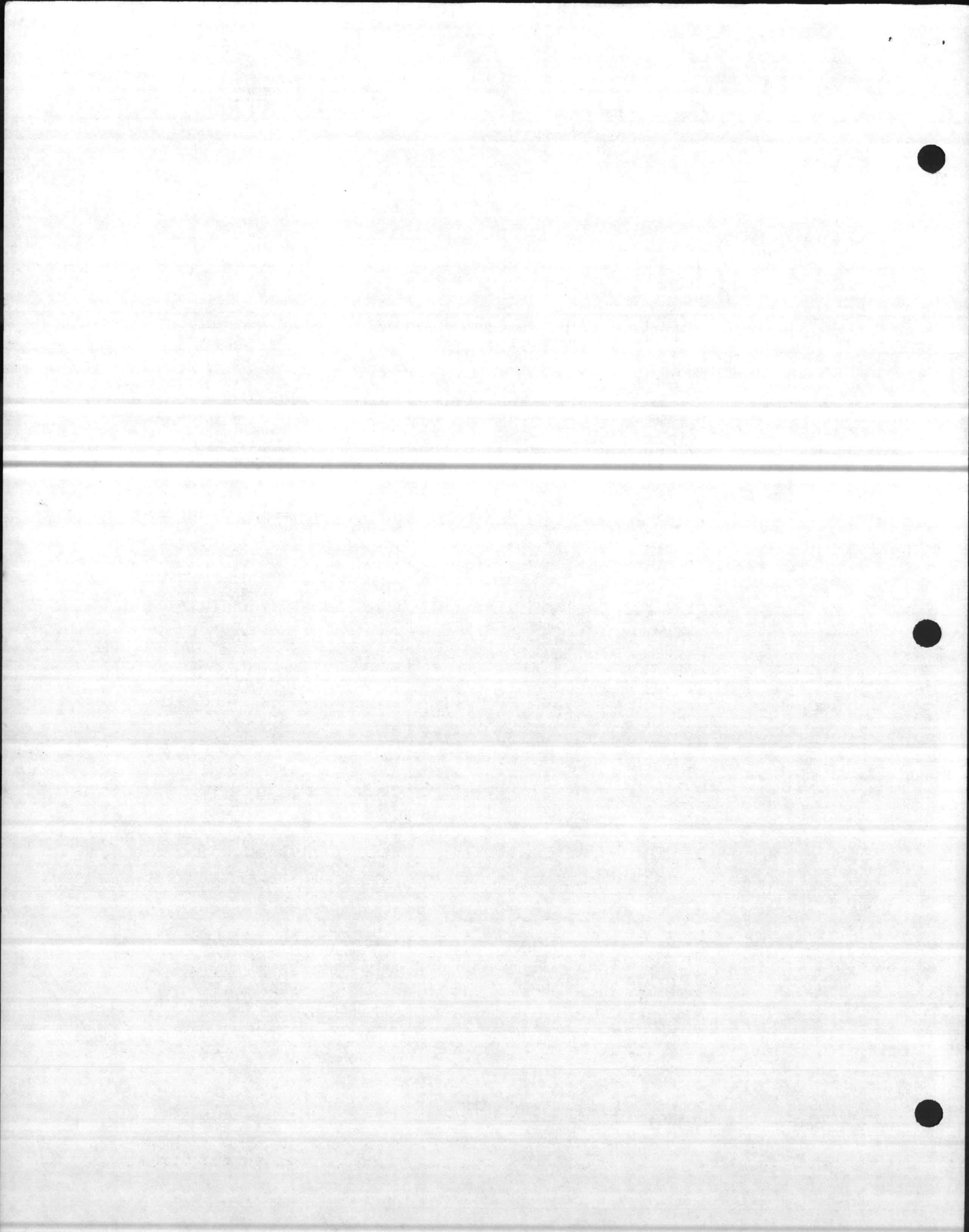
4. Transportation of Radioactive Materials

When SouthWest Nuclear arrives at your facility for a pickup, SouthWest Nuclear personnel will perform the following procedures. This is a double check of the information provided by the customer on the Radioactive Shipment Record Form.

- a. Packages will be examined visually for integrity. Only superficial scratches and very minor dents will be accepted on a package. Severe rusing or any damage that would indicate that the package may fail during transport is reason to reject a package.
- b. Closure devices will be carefully checked. In the case of open head drums, the bolt ring must be securely in place around the lid, there must be a gasket on each drum and the bolt ring must be pulled down as tightly as possible using an adequate tool of enough strength to render the bolt ring immovable and to reasonably assure that the lid would not "pop off" if the drum were dropped from a height of at least four (4) feet. A screwdriver used in the slot head of the bolts is not considered an adequate tool.
- c. Radiation Surveys will be taken at any point of the external surface of the container and at three (3) feet from the external surface of the container using a Ludlum Model 5 or equivalent.

Contamination Surveys will be taken by wiping the external surface of the container with an absorbent material, using moderate pressure and covering at least one-half the container surface. The wiping materials will be measured using a Ludlum Model 3 with a Model 44-9 thin window pancake GM Probe or equivalent to determine that no readily removable contamination exists.

- d. Labeling will be checked for compliance with DOT regulations, SouthWest Nuclear requirements and contents. Any containers that are not properly labeled or the contents are not proper for burial will be rejected.
- e. All drums in addition to any other required marking or labeling must also be clearly and legibly marked with one of the following descriptions.



- 7
1. Scintillation Vials
 2. Animal Carcasses
 3. Dry Solid
 4. Absorbed Liquids

f. Shipping documents will be prepared, RSR's checked against labels and all required certifications will be signed and completed as required.

5. Leak Test For Steel Drums

Nevada Shipments

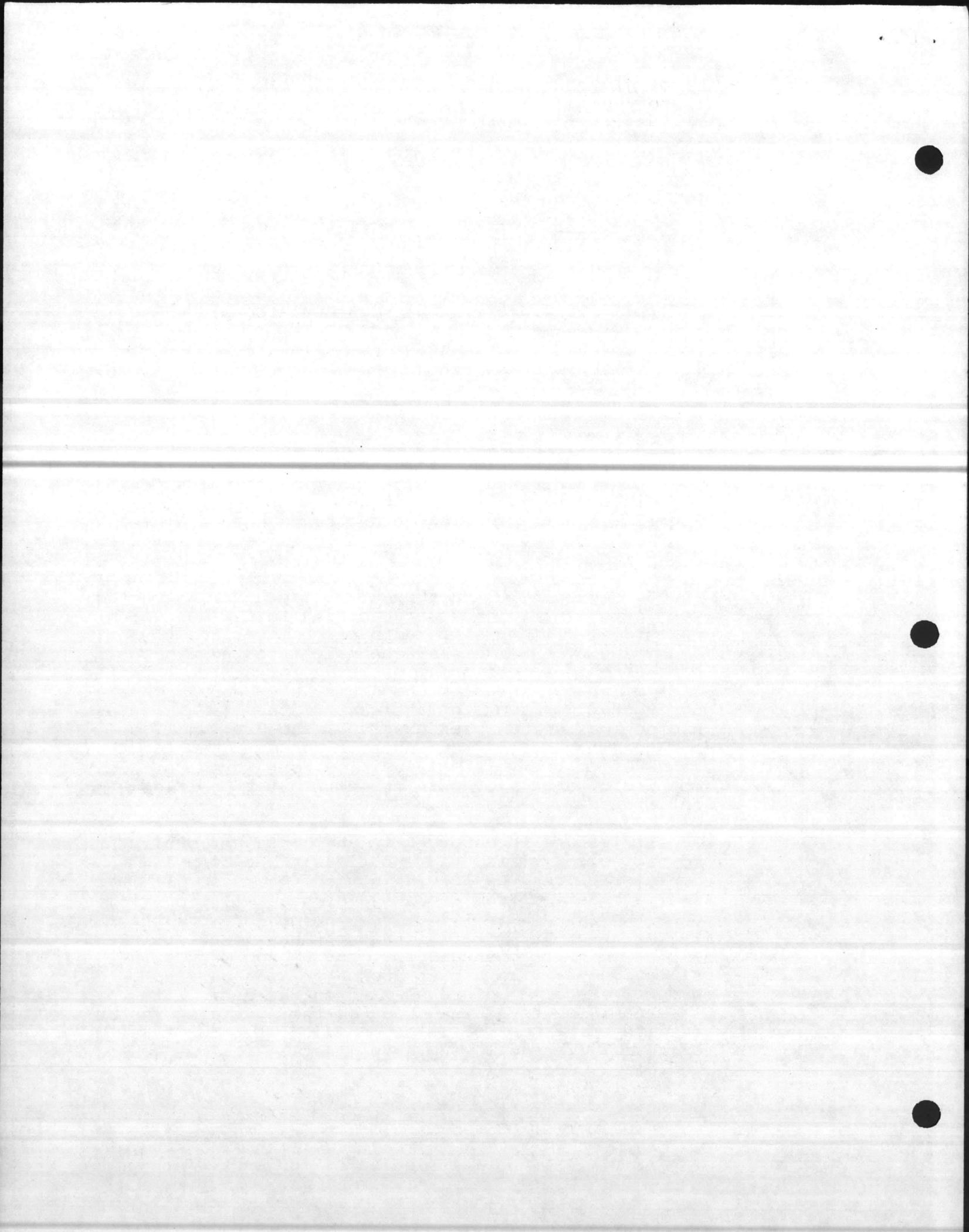
The only liquids that may be packaged for burial at the Nevada site are liquids contained in scintillation vials and none other. Also, liquids poured into absorbent materials are not acceptable. Also, liquids in bottles or any other container regardless of volume cannot be placed in a container filled with dry solid waste.

Consequently, even though you may have instructed your personnel to package according to the foregoing paragraph, all drums of radioactive materials to be picked up by SWN must have been leak tested by placing each drum in a horizontal position for at least fifteen (15) minutes. If after the drums have been in the horizontal position for at least fifteen (15) minutes and no leakage has been observed, the drum shall be marked "leak tested" and dated. The drum can then be returned to the vertical position for storage or continued to be stored in the horizontal position until pickup if desired.

If leakage is observed in any container other than scintillation vials, there obviously has been an improper placing of liquid into the package. If leakage is observed from a package of scintillation vials then two (2) possibilities come to mind immediately. 1) The absorbent material has not been added in layers as the instructions call for, and 2) too many scintillation vials have been broken or lids were not properly secured before placing in the drum. If leakage is observed in either of the foregoing instances, the drum must be re-packaged to meet burial site criteria. The following steps must be followed when leakage is observed.

Scintillation Vial Drum

As pointed out above, any leakage from a drum of scintillation vials indicates too much breakage



of glass vials and/or loose lids. Instructions to your personnel to gently place scintillation vials into drums to preclude breakage should prevent future problems. Also, all lids should be tightly secured. Loose lids would seem to be a matter that would be of concern to everyone handling them, because of possible leakage in the liquid scintillation counter and during subsequent transport to the waste container which is often in another building or room.

Corrective action you must take for a leaking scintillation vial drum is as follows:

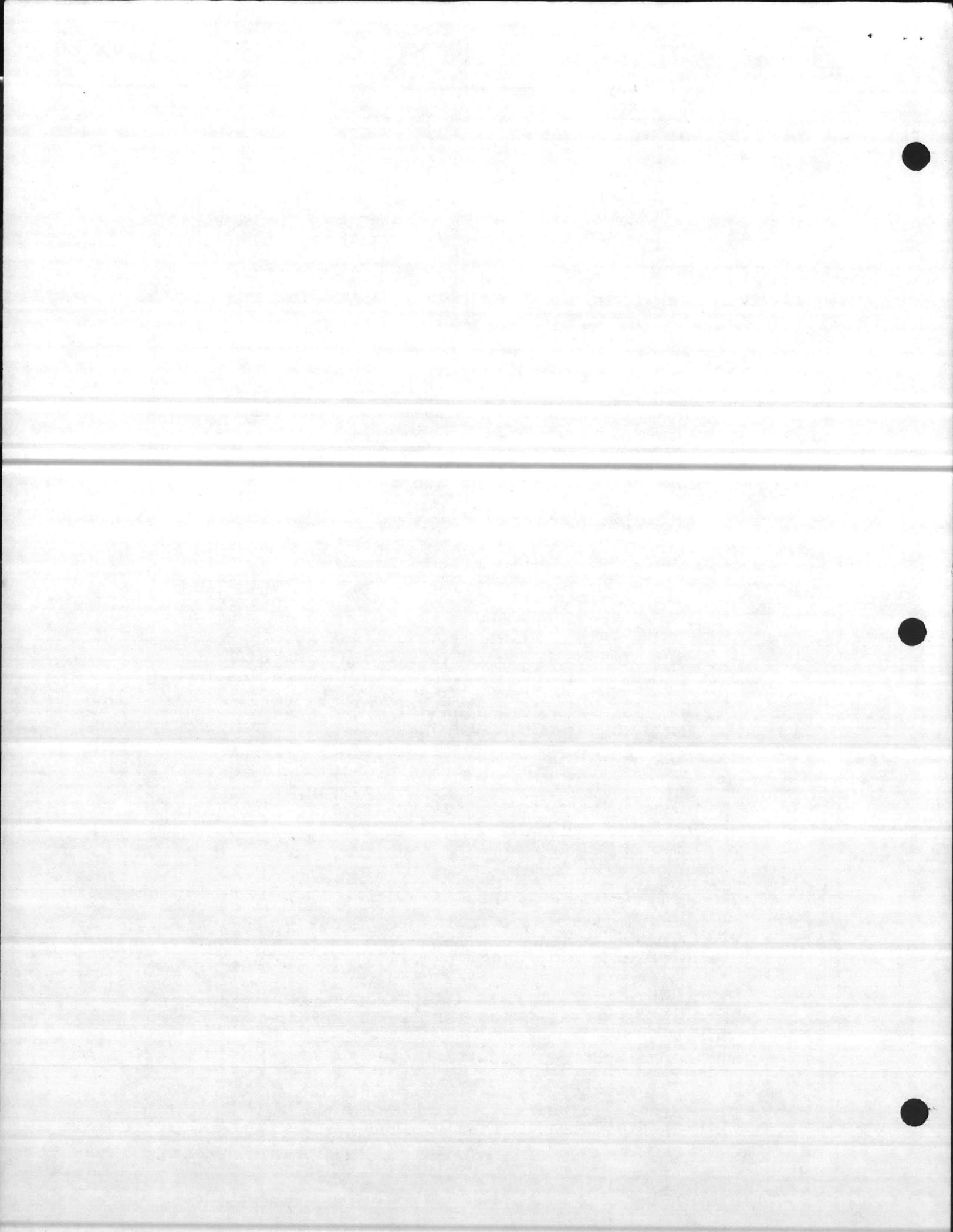
- a. Open the drum and determine what caused the liquid to leak out.
- b. Was the drum packaged in accordance with NECO packaging instructions?
- c. If not, why not?
- d. Empty the drum and re-package in accordance with NECO procedures and graphic illustration enclosed. This procedure calls for placing approximately 3" of absorbent at the bottom of the container inside a 4 mil (minimum thickness) plastic liner, place a layer of vials and absorbent not more than 6" in depth, with at least 1" of absorbent material between each layer, and at least 3" of absorbent material covering the top layer. The absorbent material must maintain these levels during handling and transport, in other words the absorbent must not settle so as to expose vials at the top level. The plastic bag must then be tightly sealed at the top with tape before the lid is put on the drum. Repeat the leak test after re-packaging.

Animal Carcass Drums

If leakage is observed from an animal carcass drum there also must have been improper packaging procedures used. As in the above section involving scintillation vials, determine why the leakage occurred and then re-package according to NECO procedures and the graphic illustration enclosed. Repeat the leak test after re-packaging.

Dry Solid Drums

If leakage is observed from a drum of dry solid waste, a serious violation of packaging procedures has occurred. There should not be and cannot be



any liquid whatsoever placed into a drum of dry solid waste.

Therefore, the drum must also be re-packaged and returned to a dry solid state. There can be absolutely no liquid, regardless of amount, left in the container. If the contents of the drum have absorbed liquid and are still wet, then that container cannot be buried in Nevada. This leaves you the alternative of complete dryness or adding sufficient approved absorbent and at additional expense, shipping to the Washington burial site.

6. State of Nevada User-Permit

The proposed system for user permits for the State of Nevada will only require the broker to get a user-permit. Therefore, this relieves you as the customer when dealing through a broker the added burden of obtaining a user-permit as is now required in the State of Washington.

7. State of Washington User-Permit

Each generator/packager who will be using the burial site in Washington either by direct shipments or through the services of a broker must obtain a State of Washington user-permit.

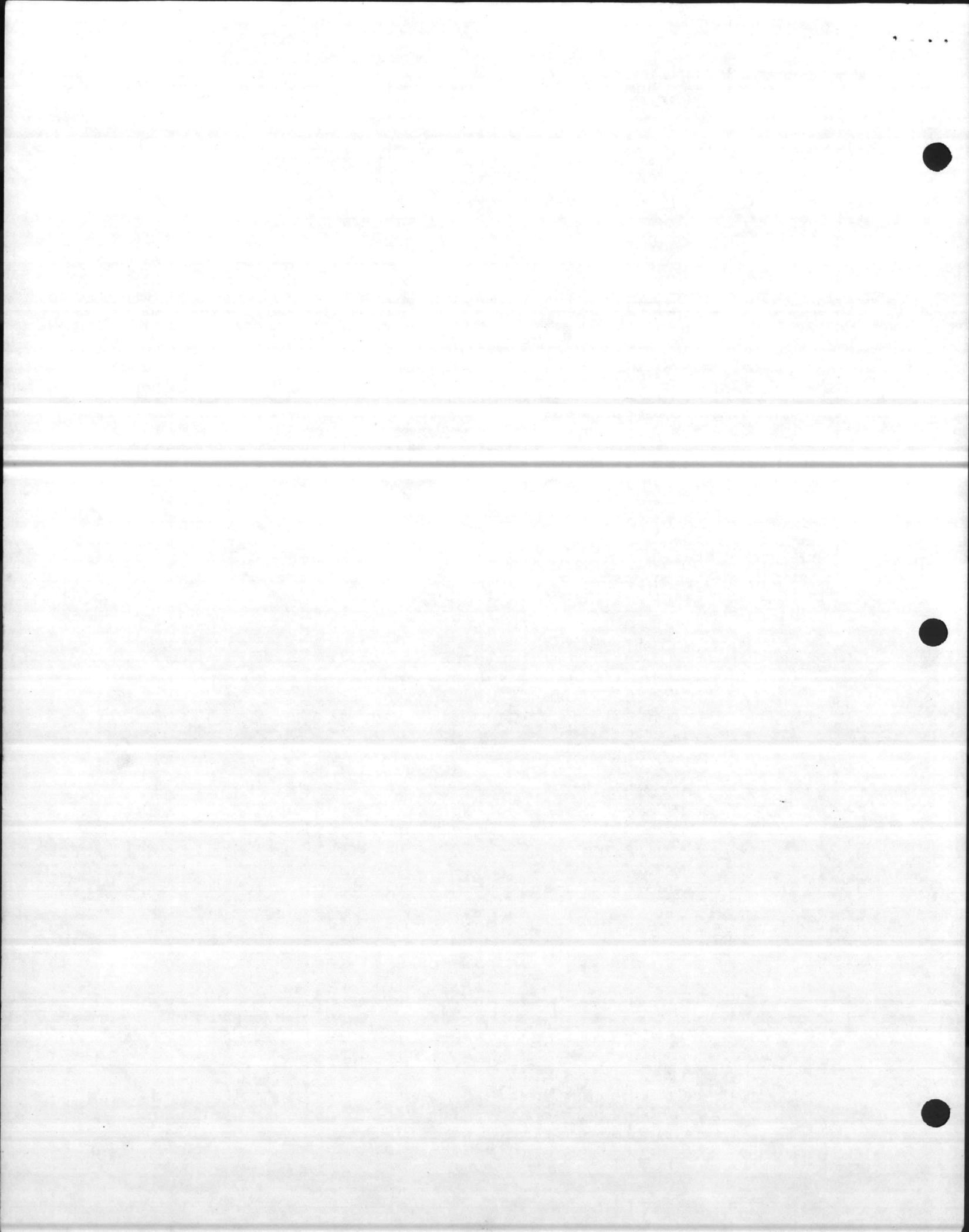
At the present time, the user-permit system has not been fully implemented, however, a letter of intent to file for a user-permit must be on file with the State of Washington Department of Social and Health Services.

SouthWest Nuclear Company is including in this information packet a suggested format for your to follow when you send your letter of intent. In addition, SouthWest Nuclear Company must have a copy of your letter of intent in our files before we will receive any further material from you.

8. Consultation and Audit Services to Generator/Packagers

SouthWest Nuclear Company will be very happy to meet with anyone requesting information on packaging, transportation and disposal of radioactive materials. It is quite difficult to write procedures that will be applicable to the various types of operations that each of our customers may be involved with. Therefore, a long hard look at each individual situation may well be the proper approach to this problem.

SouthWest Nuclear Company must also have the prerogative of observing your packaging operations from time to time. We feel that we may be able to correct any deficiencies that may have evolved through



change of personnel or simple lack of attention by your workers.

These observations will be performed quarterly at customers who are picked up weekly and at least semi-annually for those who have less frequent pickups.

