

1 CABINET FOR HEALTH AND FAMILY SERVICES

2 Department for Public Health

3 Division of Public Health Protection and Safety

4 (New Administrative Regulation)

5 902 KAR 100:180. Technologically Enhanced Naturally Occurring Radioactive  
6 Material Related to the Oil and Gas Industry.

7 RELATES TO: KRS 189.150, 211.842-211.990, 216B.050(22), Chapters 224 and  
8 353, 401 KAR Chapters 47 and 48, 902 KAR 100:010, 100:019-022, 100:040

9 STATUTORY AUTHORITY: KRS 194A.050(1), 211.090(3), 211.180(1)(a), 211.842,  
10 211.844(1), 211.865, 211.893

11 NECESSITY, FUNCTION AND CONFORMITY: KRS 194A.050(1) requires the  
12 secretary of the Cabinet for Health and Family Services to promulgate administrative  
13 regulations necessary to protect, develop, and maintain the health, personal dignity,  
14 integrity, and sufficiency of Kentucky citizens and to operate programs and fulfill the  
15 responsibilities vested in the cabinet. KRS 211.893(2) directs the cabinet to exercise its  
16 regulatory authority to ensure the proper management of oil- and gas-related wastes  
17 containing technologically enhanced naturally occurring radioactive material  
18 (TENORM). This administrative regulation establishes radiation protection standards for  
19 the possession, use, transport, transfer, and disposal of TENORM related to the oil and  
20 gas industry.

21 Section 1. Definitions. (1) "Activity concentration" means the rate of disintegration

1 (transformation) or decay of radioactive material per unit of dry mass.

2 (2)(a) "Technologically Enhanced Naturally Occurring Radioactive Material" or  
3 "TENORM" means naturally occurring radioactive material:

4 1. With a radionuclide concentration that has been increased by human activities  
5 above levels encountered in the natural state; or

6 2. Made more accessible by human activity; and

7 (b) "TENORM" does not include the natural radioactivity of rocks or soils and does  
8 not include "source material," "byproduct material," or "special nuclear material" as  
9 defined in the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.), or in  
10 902 KAR 100:010.

11 Section 2. Applicability. (1) This administrative regulation shall apply to a person  
12 who receives, owns, possesses, uses, processes, transfers, transports, distributes,  
13 arranges for the disposal of, or disposes of TENORM with an activity concentration  
14 greater than five (5.0) picocuries per gram (pCi/g).

15 (2) This administrative regulation shall apply only to TENORM related to the oil and  
16 gas industry.

17 (3) Exemptions to this administrative regulation are found in Section 3 and are not  
18 considered a hazard to public health based on scientific and health rationale.

19 Section 3. Exemptions. The following are exempt from the requirements of this  
20 administrative regulation:

21 (1) Background activity concentrations upon specific request and the written  
22 approval of the cabinet;

23 (2) Drill cuttings from wells permitted pursuant to KRS Chapter 353 and managed in

1 accordance with the requirements of that chapter; and

2 (3) Water produced from or utilized during oil or gas well development or production  
3 operations, including produced water and water flowed back following hydraulic  
4 fracturing operations that is disposed of in injection wells that are regulated and  
5 permitted in accordance with KRS Chapter 353 and, where applicable, the Safe  
6 Drinking Water Act and Underground Injection Control Program.

7 Section 4. Sample Collection and Analysis. (1) All sample collection pursuant to this  
8 section shall be conducted so as to be representative of the entire waste load or  
9 container.

10 (2) Sample collection and analysis of the TENORM-containing waste shall take  
11 place prior to disposal in the following manner:

12 (a)1. At least five (5) representative samples taken randomly from within the load or  
13 container shall be composited into one (1) sample and analyzed; or

14 2. For tubing, a sample shall be taken every 500 feet;

15 (b)1. Analysis of TENORM waste in equipment being transported or TENORM  
16 waste in soil or other media shall be conducted by a laboratory accredited by the  
17 National Environmental Laboratory Accreditation Conference to perform radiological  
18 analysis; or

19 2. The radioactivity level of TENORM waste in equipment being disposed of  
20 downhole pursuant to Section 6(4) of this administrative regulation may be measured  
21 through the use of a portable radiation detector appropriate for the radiation being  
22 measured as an alternative to intrusive sampling; and

23 (c)1. Each sample analyzed by an accredited laboratory shall be analyzed for the

1 activity concentration of combined Radium 226 and Radium 228; and

2 2. The cabinet may require additional testing if another progeny is considered to be  
3 of primary concern.

4 (3) For the purpose of determining disposal methods pursuant to Section 6 of this  
5 administrative regulation, sample collection and analysis meeting the requirements of  
6 subsection (2) of this section may additionally occur after the waste has been prepared  
7 or treated for disposal as long as the waste is not treated beyond the minimum required  
8 for disposal.

9 Section 5. Transporting TENORM Waste for Disposal. (1) Each person subject to  
10 this administrative regulation shall manage and dispose of waste containing TENORM:

11 (a) Pursuant to Section 6 of this administrative regulation; or

12 (b) In accordance with an alternate method authorized by the cabinet upon written  
13 request or upon the cabinet's initiative in accordance with this administrative regulation  
14 and administrative regulations of the Energy and Environment Cabinet.

15 (2) TENORM waste being transported for disposal shall be:

16 (a) Accompanied by a waste profile or manifest document pursuant to Section 8 of  
17 this administrative regulation;

18 (b) Covered and contained during transportation in accordance with standards of  
19 the U.S. Department of Transportation and Kentucky Transportation Cabinet; and

20 (c) Packaged or stabilized as needed to prevent dispersion during transportation or  
21 landfill placement.

22 (3) Other than TENORM wastes stored on-site prior to disposal in conjunction with  
23 an oil or gas operation permitted pursuant to KRS Chapter 353 and those materials

1 awaiting return transportation following rejection as the disposal facility in accordance  
2 with Section 6(6)(c) of this administrative regulation, the storage or treatment of  
3 TENORM waste is allowed only if licensed to do so pursuant to 902 KAR 100:040.

4 Section 6. Disposal of Waste. (1) TENORM waste with an activity concentration  
5 greater than five (5.0) and less than or equal to 100 pCi/g shall be disposed in a:

6 (a) Landfill meeting the design and construction standards of a contained landfill as  
7 defined by the Energy and Environment Cabinet that:

8 1. Possesses a current permit demonstrating compliance with the requirements of  
9 KRS 224 and administrative regulations promulgated thereunder; and

10 2. Ensures the disposal is in accordance with statutory provisions of KRS 224 or  
11 regulatory provisions of 401 KAR that apply specifically to the disposal of TENORM  
12 waste in such a facility; or

13 (b) Well that is regulated and permitted for such disposal pursuant to the  
14 requirements of subsection (4) of this section.

15 (2) TENORM waste with an activity concentration greater than 100 and less than or  
16 equal to 200 pCi/g shall be disposed of in a:

17 (a) Landfill located in Kentucky specifically permitted by the Energy and  
18 Environment Cabinet to accept such TENORM wastes for disposal or located in Illinois  
19 as specified under the terms and conditions of the Central Midwest Interstate Low-Level  
20 Radioactive Waste Compact pursuant to KRS 211.859;

21 (b) Licensed low-level radioactive waste disposal facility as directed by 902 KAR  
22 100:021; or

23 (c) Regulated and permitted well pursuant to the requirements of subsection (4) of

1 this section.

2 (3) TENORM waste with an activity concentration greater than 200 pCi/g shall be  
3 disposed of in a:

4 (a) Licensed low-level radioactive waste disposal facility as directed by 902 KAR  
5 100:021; or

6 (b) Regulated and permitted well pursuant to the requirements of subsection (4) of  
7 this section.

8 (4) The downhole disposal of TENORM waste into a well from which the TENORM  
9 waste was generated or a well on the same lease is allowed if:

10 (a) The well is permitted by the Energy and Environment Cabinet;

11 (b) Disposal is done in accordance with the requirements of the Energy and  
12 Environment Cabinet; and

13 (c) The radioactivity is analyzed pursuant to Section 4 of this administrative  
14 regulation and reported to and maintained by the Energy and Environment Cabinet.

15 (5) TENORM waste disposed of in a landfill shall not be removed from the landfill.

16 (6) TENORM waste disposed in a landfill shall be covered by at least one (1) foot of  
17 non-TENORM waste or daily cover material by the end of each operating day or at least  
18 once every twenty-four (24) hour period for a continuously-operating landfill.

19 (7) TENORM wastes shall be disposed at a depth greater than ten (10) feet below  
20 the surface of the final landfill cover.

21 (8) TENORM waste imported from outside of Kentucky or Illinois is prohibited from  
22 being disposed of in Kentucky pursuant to KRS 211.859.

23 (9) If prohibited TENORM waste is delivered to a landfill for disposal, the waste

1 shall be rejected. The owner or operator of the landfill shall:

2 (a) Record the:

3 1. Source;

4 2. Amount;

5 3. Generator; and

6 4. Other identifying information about the rejected waste; and

7 (b) Notify the cabinet by telephone, fax, or electronic mail within one (1) business  
8 day of the rejection, impoundment, and quarantine of such material; and

9 (c) Impound and quarantine the waste load until the cabinet determination on the  
10 disposition of the waste providing that the impounding and quarantining of such waste  
11 by the owner or operator of the landfill shall not constitute storage nor cause the owner  
12 or operator of the landfill to become responsible under law for the further management  
13 or disposition of such waste.

14 (10) Records of disposal, including waste profiles and manifests, shall be  
15 maintained by the owner or operator of the landfill for thirty (30) years after closure of  
16 the facility.

17 Section 7. Material or Real Property Containing TENORM. (1) The transfer of  
18 TENORM not exempt pursuant to Section 3 is authorized if the equipment and facilities  
19 contaminated with TENORM are to be used by the recipient for the same purpose.

20 (2) Transfers made pursuant to subsection (1) of this section do not relieve the  
21 person making the transfer from the responsibilities of assessing the extent of TENORM  
22 contamination or material present, informing the person receiving the TENORM of these  
23 assessments, and maintaining records required by this administrative regulation.

1 (3) The transfer of TENORM products not exempt in Section 3 is authorized  
2 provided the requirements of this section are met and the product is accompanied by a  
3 waste profile or manifest document pursuant to Section 8.

4 (4) The remediation of material contaminated with TENORM shall be performed  
5 only if licensed to do so pursuant to 902 KAR 100:040.

6 Section 8. Record Keeping Requirements. (1) A person in possession of TENORM  
7 waste with an activity concentration greater than five (5.0) and less than or equal to 100  
8 pCi/g being transported for management or disposal shall maintain and provide to the  
9 off-site treatment or disposal facility receiving such waste a waste profile or manifest  
10 containing such information as required by the Energy and Environment Cabinet.

11 (2) A person in possession of TENORM waste with an activity concentration greater  
12 than 100 and less than or equal to 200 pCi/g being transported shall maintain a copy of  
13 the TENORM Manifest, RPS 180. The manifest shall contain the:

14 (a) Name and signature of any:

15 1. Generating facility owner or operator;

16 2. Transporter company; and

17 3. Receiving facility owner or operator.

18 (b) Identify and business contact information of the accredited laboratory that  
19 analyzed the samples;

20 (c) Type, amount, activity concentration, and source of TENORM being transported;

21 and

22 (d) Unique tracking number established by the generator.

23 (3) A person in possession of TENORM waste with an activity concentration greater



1 than 200 pCi/g being transported shall maintain records in accordance with 902 KAR  
2 100:021.

3 Section 9. Worker Training and Safety. (1) A landfill approved for the disposal of  
4 TENORM waste pursuant to Section 6(2) shall implement a worker training program  
5 and safety program to meet the requirements of 902 KAR 100:019.

6 (2) A landfill permitted to accept TENORM waste pursuant to Section 6(2) shall  
7 monitor individuals for exposure to radiation and radioactive material as required by 902  
8 KAR 100:019, Section 13, for at least two (2) years. Personnel dosimeters shall meet  
9 the requirements of 902 KAR 100:019, Section 12. If the average result is less than 200  
10 mrem/year total effective dose equivalent, suspension of individual monitoring may be  
11 requested and approved in writing by the cabinet.

12 Section 10. Violations. (1) A violation of this administrative regulation shall be  
13 subject to KRS 211.869(1) and (3) and KRS 211.990(2) and (4).

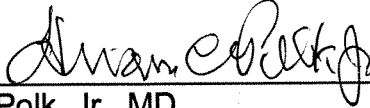
14 (2) A violation of an Energy and Environment Cabinet regulation referenced in this  
15 administrative regulation shall not be subject to the provisions of KRS 211.869 or KRS  
16 211.990.

17 Section 11. Incorporation by Reference. (1) "RPS 180, TENORM Manifest",  
18 5/2017, is incorporated by reference.

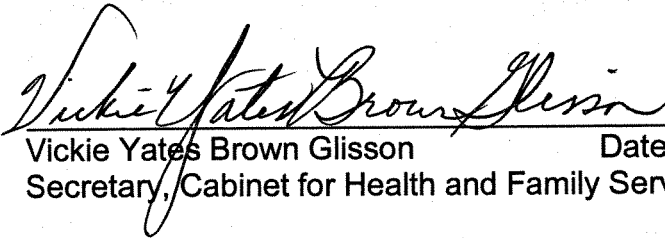
19 (2) This material may be inspected, copied, or obtained, subject to applicable  
20 copyright law, at the Department for Public Health, 275 East Main Street, Frankfort,  
21 Kentucky 40621, Monday through Friday, 8 a.m. to 4:30 p.m.

902 KAR 100:180

REVIEWED:

 2-17-17  
\_\_\_\_\_  
Hiram C. Polk, Jr., MD Date  
Commissioner, Department for Public Health

APPROVED:

 5/8/17  
\_\_\_\_\_  
Vickie Yates Brown Glisson Date  
Secretary, Cabinet for Health and Family Services

## PUBLIC HEARING AND PUBLIC COMMENT PERIOD

A public hearing on this administrative regulation shall, if requested, be held on June 21, 2017, at 9:00 a.m. in DCLC Room B, Health Services Building, First Floor, 275 East Main Street, Frankfort, Kentucky, 40621. Individuals interested in attending this hearing shall notify this agency in writing by June 14, 2017, five (5) workdays prior to the hearing, of their intent to attend. If no notification of intent to attend the hearing is received by that date, the hearing may be canceled. The hearing is open to the public. Any person who attends will be given an opportunity to comment on the proposed administrative regulation. A transcript of the public hearing will not be made unless a written request for a transcript is made. If you do not wish to attend the public hearing, you may submit written comments on this proposed administrative regulation until June 30, 2017. Send written notification of intent to attend the public hearing or written comments on the proposed administrative regulation to:

**CONTACT PERSON:** Tricia Orme, Administrative Specialist, Office of Legal Services, 275 East Main Street 5 W-B, Frankfort, KY 40621, Phone: 502-564-7905, Fax: 502-564-7573; [Tricia.Orme@ky.gov](mailto:Tricia.Orme@ky.gov).

## REGULATORY IMPACT ANALYSIS AND TIERING STATEMENT

Regulation: 902 KAR 100:180

Contact Person: Laura Begin, [Laura.Begin@ky.gov](mailto:Laura.Begin@ky.gov), phone 502-564-3970, ext. 4066, and Tricia Orme, [Tricia.Orme@ky.gov](mailto:Tricia.Orme@ky.gov), phone 502-564-7905, ext. 3421

(1) Provide a brief summary of:

(a) What this administrative regulation does: This administrative regulation establishes radiation protection standards for the possession, use, transport, transfer, and disposal of technologically enhanced naturally occurring radioactive material (TENORM) related to the oil and gas industry.

(b) The necessity of this administrative regulation: KRS 211.842(1) states that the Cabinet is the radiation control agency of the State of Kentucky. House Bill 563 passed as emergency legislation in the 2016 Regular Session and created KRS 211.893. KRS 211.893(2) directs the Cabinet to exercise its regulatory authority to ensure the proper management of oil- and gas-related wastes containing NORM.

(c) How this administrative regulation conforms to the content of the authorizing statutes: KRS 194A.050(1) requires the Secretary of the Cabinet to adopt administrative regulations necessary to protect the health of the individual citizens of the Commonwealth and necessary to operate the programs and fulfill the responsibilities vested in the Cabinet. KRS 211.893(2) directs the Cabinet to exercise its regulatory authority to ensure the proper management of oil- and gas-related wastes containing NORM. This administrative regulation contains safe methods of disposal for TENORM of different radioactivity levels.

(d) How this administrative regulation currently assists or will assist in the effective administration of the statutes: Generators of TENORM waste from the oil and gas industry and those involved with the disposal of TENORM waste will know how to safely dispose of radioactive material.

(2) If this is an amendment to an existing administrative regulation, provide a brief summary of:

(a) How the amendment will change this existing administrative regulation: This is a new administrative regulation.

(b) The necessity of the amendment to this administrative regulation: This is a new administrative regulation.

(c) How the amendment conforms to the content of the authorizing statutes: This is a new administrative regulation.

(d) How the amendment will assist in the effective administration of the statutes: This is a new administrative regulation.

(3) List the type and number of individuals, businesses, organizations, or state and local governments affected by this administrative regulation: The oil and gas industry, processors and transferors of oil and gas related wastes, specific licensees, landfills receiving oil and gas related wastes, and the Energy and Environment Cabinet as it permits oil and gas operations and the landfill industry.

KRS 211.893 encouraged the Energy and Environment Cabinet and Cabinet for Health and Family Services to seek input from stakeholders in the development of this administrative regulation, resulting in the reemergence of an oil and gas workgroup. This workgroup is composed of representatives from the Energy and Environment Cabinet, Kentucky Chamber of Commerce, Kentucky Geological Survey, oil and gas industry, landfill industry, environmental advocacy groups, and the Cabinet for Health and Family Services (OLS and DPH). The public at large has also attended these meetings. This administrative regulation is largely the result of workgroup meetings and communications.

(4) Provide an analysis of how the entities identified in question (3) will be impacted by either the implementation of this administrative regulation, if new, or by the change, if it is an amendment, including:

(a) List the actions that each of the regulated entities identified in question (3) will have to take to comply with this administrative regulation or amendment: Generators of oil and gas related waste containing TENORM will be required to obtain representative samples of the load or container, composite the sample if able, and have it analyzed for the activity concentration of Radium-226 and -228. How the waste is disposed of is determined by its radioactivity, whether that be on-site, down-hole disposal, in a facility permitted as a landfill, in a special TENORM landfill, or in a low level radioactive waste (LLRW) facility. Required information must be contained on a TENORM manifest and the manifest will accompany the waste throughout transfer(s) to the disposal facility. If one were established, a TENORM specific landfill would be required to implement a worker training program and safety program and shall monitor individuals for exposure to radiation for at least two years.

(b) In complying with this administrative regulation or amendment, how much will it cost each of the identities identified in question (3): The tests for activity concentration from a waste sample costs approximately \$100.00. The cost of disposal will vary depending on the radioactivity of the waste, but it will be cheaper or the same as current costs as all TENORM wastes must be transferred to a LLRW facility out west in the absence of this regulation. The radiation monitoring a TENORM specific landfill would have to perform would cost about \$20.00/person/year.

(c) As a result of compliance, what benefits will accrue to the entities identified in question (3): The oil and gas industry and landfill industry will have reduced liability and will know that following this regulation results in less risk of radiation exposure to the citizens of Kentucky. Depending on the level of radioactivity, some waste will be disposed of on-site, at a regular landfill, or down-hole instead of having to be transferred to another state. There are currently no TENORM-specific landfills in Kentucky, but this

regulation may make their development economically feasible.

(5) Provide an estimate of how much it will cost the administrative body to implement this administrative regulation:

(a) Initially: There are no costs to the administrative body associated with this administrative regulation.

(b) On a continuing basis: There are no costs to the administrative body associated with this administrative regulation.

(6) What is the source of the funding to be used for the implementation and enforcement of this administrative regulation: There is no cost to the administrative body associated with this administrative regulation or the enforcement of such. The administrative body will only be involved upon request or complaint, as it currently is in TENORM matters.

(7) Provide an assessment of whether an increase in fees or funding will be necessary to implement this administrative regulation, if new or by the change, if it is an amendment: No increase in fees or funding is associated with this administrative regulation.

(8) State whether or not this administrative regulation established any fees or directly or indirectly increased any fees. No fees are associated with this amendment.

(9) TIERING: Is tiering applied? Yes. This administrative regulation contains different methods of disposal for different radioactivity levels of TENORM waste. This administrative regulation is not applicable concerning TENORM waste with a radioactivity level of five (5.0) picocuries per gram or less.

## FISCAL NOTE ON STATE OR LOCAL GOVERNMENT

Regulation: 902 KAR 100:180

Contact Person: Laura Begin, [Laura.Begin@ky.gov](mailto:Laura.Begin@ky.gov), phone 502-564-3970, ext. 4066, and Tricia Orme, [Tricia.Orme@ky.gov](mailto:Tricia.Orme@ky.gov), phone 502-564-7905, ext. 3421

1. What units, parts or divisions of state or local government (including cities, counties, fire departments, or school districts) will be impacted by this administrative regulation? The Energy and Environment Cabinet will be promulgating and amending administrative regulations for the permitting and enforcement of activities associated with this program (oil and gas industries and landfills) and referencing this administrative regulation for radiation standards.

2. Identify each state or federal statute or federal regulation that requires or authorizes the action taken by the administrative regulation. KRS 194A.050(1) requires the secretary of the cabinet to adopt administrative regulations necessary to protect the health of the individual citizens of the Commonwealth and necessary to operate the programs and fulfill the responsibilities vested in the Cabinet. KRS 211.842(1) states that the Cabinet is the radiation control agency of the State of Kentucky. House Bill 563 passed as emergency legislation in the 2016 Regular Session and created KRS 211.893. KRS 211.893(2) directs the cabinet to exercise its regulatory authority to ensure the proper management of oil- and gas-related wastes containing NORM.

3. Estimate the effect of this administrative regulation on the expenditures and revenues of a state or local government agency (including cities, counties, fire departments, or school districts) for the first full year of the administrative regulation.

(a) How much revenue will this administrative regulation generate for the state or local government (including cities, counties, fire departments, or school districts) for the first year? This administrative regulation does not generate revenue.

(b) How much revenue will this administrative regulation generate for the state or local government (including cities, counties, fire departments, or school districts) for subsequent years? This administrative regulation does not generate revenue.

(c) How much will it cost to administer this program for the first year? There are no costs to the administrative body associated with this administrative regulation and the radiation control program is already in operation.

(d) How much will it cost to administer this program for subsequent years? There are no costs to the administrative body associated with this administrative regulation and the radiation control program is already in operation.

Note: If specific dollar estimates cannot be determined, provide a brief narrative to explain the fiscal impact of the administrative regulation.

Revenues (+/-):

Expenditures (+/-):

Other Explanation:

COMMONWEALTH OF KENTUCKY  
CABINET FOR HEALTH AND FAMILY SERVICES  
DEPARTMENT FOR PUBLIC HEALTH

902 KAR 100:180.

Technologically Enhanced Naturally Occurring Radioactive Material Related to the Oil  
and Gas Industry.

Summary of Material Incorporated by Reference

Form "RPS 180, TENORM Manifest", 5/2017, is the form required to accompany the TENORM waste load or container as it is transferred for disposal. This is a new form. This form is one (1) page.

The document listed above contains the type and characteristics of the waste and identifies the generator, transporter, and receiver of the TENORM waste.

The total number of pages incorporated by reference for this amendment is one (1) page.





# TENORM Manifest



**Kentucky Public Health**  
Prevent. Promote. Protect.

RPS 180  
5/2017

**Department for Public Health**  
**Division of Public Health Protection and Safety**  
**Radiation Health Branch**  
**275 East Main St., Mailstop HS1C-A**  
**Frankfort, KY 40621-0001**

Tracking Number:

1. Generator's Name and Mailing Address		2. Generator's Site Address (If Different)	
Generator's Phone:			
3. Transporter 1 Company Name		DOT No.	
4. Transporter 2 Company Name		DOT No.	
5. Receiving Facility Name and Site Address		EEC Permit or Specific License No.	
Facility's Phone:			
6. Certified Laboratory Name		Lab Certification No.	
7. Type of Waste	8. No. of Containers	9. Net Weight	10. Activity Concentration
Use:			
11. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above and meet the requirements for transport of state and national regulations.			
Generator's Printed or Typed Name:		Signature:	Date:
12. Transporter Acknowledgement of Receipt of Materials			
Transporter 1 Printed or Typed Name:		Signature:	Date:
13. Transporter Acknowledgement of Receipt of Materials			
Transporter 2 Printed or Typed Name:		Signature:	Date:
14. Receiving Facility Owner or Operator: Certification of receipt of TENORM waste covered by manifest.			
Owner or Operator Printed or Typed Name:		Signature:	Date:

