

PROCEDURE:
REVISION:
DATE:

KM-MC-10-1
10
October 16, 1990

CIMARRON CORPORATION
CIMARRON FACILITY

SUBJECT: LOW LEVEL RADIOACTIVE WASTE PACKAGING AND SHIPPING

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I. INTRODUCTION

Cimarron Corporation is maintaining a radioactive waste disposal contract with Chem-Nuclear Systems, Inc.; a radioactive waste transport permit with the South Carolina Department of Health and Environmental Control; and an export permit with the Central Interstate Low-Level Radioactive Waste Compact Commission. This contract and permits allows the Cimarron Corporation to ship low-level radioactive waste to Chem-Nuclear's Barnwell, S.C. Disposal Facility from the Cimarron Facility and the Cushing Facility.

II. WASTE CLASSIFICATION

All of the low-level radioactive waste from Cimarron and Cushing shall be shipped as LSA (low specific activity) waste. The LSA waste shall be shipped as Class A waste. The waste will meet LSA Class A quantity limits in compliance with DOT 49CFR Part 173.043 (n) (4) and/or (5); NRC 10 CFR Part 61.55 (a) (6); and NRC 10 CFR Part 7 4.

The quantity of natural thorium and/or uranium enriched to less than 5% U-235 is unlimited for Class A waste. However, to avoid fissile classification requirements, enriched uranium waste shall be limited to a maximum of 15 grams of U-235 per drum. No upper limit will be applied for surface alpha contamination levels for < 5% enriched contamination on externally contaminated non radioactive objects, provided the radioactive contamination is not readily dispersible. However, objects with contamination levels of 15,000 d/m alpha or greater per 100 cm² will require NDA of the object or calculations by Health Physics personnel to assure that the 15 grams of U-235 per 55 gallon drum limit is not exceeded.

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III. LSA CLASS A WASTE FORM CLASSIFICATION

All Class A waste must be classified as to waste form as either "Class A Stable" or as "Class A Unstable". The stability classification does not refer to the chemical stability of the waste, but rather to the ability of the waste to retain its non-disposable solid structure after hundreds of years in the disposal trench. All waste shipped as "stable" must be backed up by documentation that demonstrates that the waste meets the performance standards as specified in the NRC document entitled "Technical Position on Waste Form", May 1983.

Ordinary trash type waste which tends to be unstable is co-mingled in the LSA waste being produced at Cimarron & Cushing. All of the LSA waste shipped from Cimarron & Cushing will be classified as "Class A Unstable". All liquid waste shall be solidified or stabilized with Portland cement. Process controls for stabilized or solidified "Class A Unstable" waste need only to demonstrate that the product is a free standing monolith with no more than 0.5 percent of the waste volume as free liquid.

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IV. PACKAGING REQUIREMENTS

LSA material will be packaged in 55 gallon metal drums and will be shipped in "Closed Transport Vehicles" and consigned as exclusive use (sole use) vehicles. Shipments in sole use vehicles are exempt from specification packaging, marking, and labeling, provided that the shipment meets the requirements of DOT Regulation 173.425 (b). The following packaging requirements shall be followed:

1. The 55 gallon drums used to package LSA waste shall be new 17-H drums. The drums shall have heavy duty closure rings with a 5/8 inch or larger bolt. When the filled waste drum is closed up, the closure ring bolt shall be torqued with a minimum of 40 foot-pounds.
2. The outside surfaces of the drums shall not have surface contamination exceeding:
 - a. Fixed - 2200 d/m alpha per 100 cm² (1320 d/m alpha per 60 cm² probe)
 - b. Smearable - 220 d/m per 100 cm² (132 d/m alpha per 60 cm² probe).
3. External radiation levels shall be less than 200 mRem per hour at any point on the external surface of the drums. The dose rate must be less than 2 mRem/hr. in any normally occupied position in the vehicle and less than 10 mrem/hr. at 6' from the vehicle.
4. The maximum total SNM content per drum shall be limited to no more than 15 grams of U-235.
5. Void spaces within the waste and between the waste and the drum shall be reduced to the extent practicable. The void spaces shall be less than 15% of the total volume of the drum.

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6. All liquid wastes shall be stabilized or solidified and must meet the no detectable free standing liquid requirements. Shipping papers shall include certification that the waste has no free standing liquids. See Item 7 for packaging requirements for oil. Liquids with a pH of less than 4.0 shall be neutralized before they are stabilized.

Cemented liquids must be allowed at least three days to cure and be inspected for free standing liquid before lids are put in place for shipment.

Portland cement is acceptable for solidification or stabilization at the Barnwell site for aqueous liquids and other applicable waste forms with a specific activity of less than one microcurie per cubic centimeter.

- (a) When Class A liquid waste is stabilized, it shall be stabilized with Portland cement to a free standing monolith hardness. Normally one sack of cement per 8 to 10 gallons of liquid will be adequate.
- (b) Dewatered wet solids (sludges) shall be stabilized with Portland cement.
- (c) Damp wipes shall be either dried or an excess of Portland cement shall be added to the bag of wipes to prevent an accumulation of condensate inside the plastic bag. Absorbed liquids are not acceptable at Barnwell.
- (d) Portland cement may be used to top off a drum of contaminated dirt to prevent accumulation of condensate on the underside of the lid of sealed drums, for shipments from site.

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7. Barnwell will not accept oil or lubricants in any physical form. However, they will accept waste containing incidental or trace amounts of oil which has been absorbed, provided that the amount of absorbed oil does not exceed one percent by waste volume in a container. There is no solidification media for oil that is acceptable by Barnwell.
8. Ion exchange resins shall be stabilized with cement to a free standing monolith hardness with no free standing liquid. Records of complete radiological analysis (quantitative and qualitative) must be provided for shipment to Barnwell. The records must specify the specific activity of each radionuclide expressed in microcuries per cubic centimeter.
9. The concentration of a radionuclide or radionuclide mixture may be averaged over the volume of the waste and, if used, the solidification agent or matrix if the waste form is a homogeneous mixture.
10. The following materials are prohibited: Free liquids, pyrophorics, explosives, untreated alkali metals, pressurized containers, and materials that could lead to spontaneous combustion or react violently with water or moisture. The process for rendering pyrophoric material to a non-pyrophoric state must be submitted and approved by the Manager of Regulatory Affairs for shipment to Barnwell.

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11. The 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. There shall be no significant chemical, galvanic, or other reaction among the packaging components, or between the packaging components and the package contents.
12. If wastes are contaminated with radioactive materials and contain hazardous materials or substances listed in the appendix to Section 172.101 of the DOT Regulations, prior approval must be received from the burial site for the shipment. As of this date, Barnwell will accept contaminated asbestos if properly described on the shipping manifest and labeled in compliance with DOT requirements.
13. Waste containing chelating agents with concentrations greater than eight percent are not acceptable at Barnwell. Waste containing 0.1% to 8.0% must be solidified.
14. Incinerator ash or powdered material shall be stabilized with Portland cement for shipment to Barnwell.
15. Concrete, when used as an encapsulation medium around a sealed source centered in a fifty-five gallon drum containing concrete, shall have a formulated compressive strength greater than or equal to 2500 psi.
16. The gross weight of drums of LSA waste shall be limited to no more than 800 pounds.
17. Upon arrival at the waste disposal sites, the drums shall not show significant deformation or degradation due to rust or other chemical action which results in a loss of container integrity.

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V. LABELING AND PLACARDING REQUIREMENTS

A. Labeling

The labeling on each drum of LSA waste shall be stenciled on with paint of a contrasting color. The lettering shall be 0.75" in height. In addition to "Radioactive LSA", each drum shall be labeled to show waste class, drum identification number, who it was inspected by, date of inspection, gross weight, and the grams of SNM contained in the drum. The labeling shall be placed on the drum lid and on the upper portion of the side of the drum as shown below:

1. LSA Waste

Drum No. _____
Gms. U-235 _____
Lbs. GWT. _____

Radioactive LSA
Class A Unstable
Inspected by: _____
Date Inspected: _____

2. Waste Containing Asbestos

The two stick on labels shown on the following page shall be attached to each drum containing asbestos. The labels shall be placed two or three inches to the side of the above labeling.

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CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS

PROPER D.O.T. SHIPPING NAME



HAZARDOUS WASTE

FEDERAL AND STATE LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND CONTACT THE NEAREST POLICE OR PUBLIC SAFETY
AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATORS INFORMATION:

NAME Cimarron Corporation - Cimarron Facility
ADDRESS P. O. Box 313
CITY Crescent STATE OK ZIP 73028 PHONE NO. 232-5471
EPA IDENTIFICATION NUMBER UN-2590 (405)
MANIFEST DOCUMENT NUMBER _____
ACCUMULATION START DATE _____

CONTAINS HAZARDOUS OR TOXIC WASTE
HANDLE WITH CARE



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B. Placarding

The transport trailer must be placarded on each end and each side with a 10.75" square on point "Radioactive" placard as prescribed by 172.556. The top portion of the placard must be yellow with a black radiation symbol and the lower portion must be white with the word "Radioactive" in black.

The placards must not be obscured in any way. Placards must be at least three inches from other words or symbols to assure that they do not detract from the meaning of the placards.

VI. LOADING REQUIREMENTS FOR SHIPMENTS

1. The LSA drums of waste shall be loaded in closed semi-trailer vans by the consignor and unloaded only by the consignee from the same van in which the waste was originally loaded.
2. There shall be no loose radioactive material in the truck or the van.
3. Sufficient dunnage, shoring and/or bracing shall be utilized to prevent the shifting of drums and to minimize impact damage of drums within the cavity under normal and accident conditions.
4. Without prior arrangements with the carrier, the maximum weight of the load including dunnage, shoring and bracing must not exceed 42,000 pounds.
5. Each shipment to Barnwell shall be limited to a maximum total ENM content of not more than 4500 grams of U-235.
6. When vans are loaded with loads that require double stacking, the heaviest drums shall be loaded on the bottom.

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7. The doors of the trailer shall be sealed with a tamper safe seal and locked. Keys to the lock will be in the custody of the truck driver.

VII. SHIPPING PAPERS

The Administration and Accountability Supervisor procures information for the manifest, completes the shipping papers, and submits them to the Standby Manager for approval. Attached to this procedure are copies of the various forms to be filled out to accompany the shipments.

- A. The following information shall be provided in the shipment papers with each waste shipment:

1. Name, address and telephone number of the generator.

Cimarron Corporation
Cimarron Facility
P. O. Box 315
Crescent, OK 73028
Attn: A. W. Norwood 405/232-5471

2. Name, address and telephone number of the carrier.

Tri-State Motor Transit Co.
P. O. Box 113
Joplin, Missouri 64802
Attn: Mr. Don Ritchie 800/872-8768

3. Name, address and telephone number of receiver.

Chem-Nuclear Systems, Inc.
P. O. Box 726
Barnwell, South Carolina 29812
Attn: Scheduling Office 803/259-3577

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4. Description of waste.

- (a) Proper shipping name - "Waste Radioactive Material, LSA, N.O.S., UN-2912";

If as much as 100 millicuries of uranium or 10 millicuries of thorium, or a combination of the two equals or exceeds a unity of one, in any one drum, "RQ Radionuclides" shall be inserted in front of the above description.

If the drum also contains asbestos the following waste description must be included on the manifest "RQ Hazardous Substance, Solid, N.O.S., ORM-E, UN-2590, (Asbestos)".

- (b) Waste Classification - "Class A Unstable";
- (c) Fissile Class - "Fissile Exempt";
- (d) Physical and Chemical Form;
- (e) Volume of waste;
- (f) Radionuclide identity and quantity, total radioactivity;
- (g) Stabilization agent - "Portland Cement";
- (h) Chelating agent(s) - waste containing more than 0.1% chelating agent by weight must be identified and the weight % estimate shown; and,
- (i) Transport Index - not required for these shipments.

5. Instructions.

Specific written instructions for maintenance of the exclusive use shipment controls must be provided to the driver.

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6. The shipping papers shall also 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 transportation according to the applicable regulations of the Department of Transportation and NRC. The certification must be signed by an authorized representative of the waste generator.
- B. The forms described below constitute the shipping papers required for shipments to Barnwell, South Carolina:

1. DOE/NRC Form 741 - "Nuclear Material Transaction Report".

For shipments to Barnwell, the 741 will be consigned to Janie Boyles. The truck driver will be instructed to receive positive identification of the receiver by signature before consigning over such shipments.

2. South Carolina Department of Health and environmental Control Form (DMEC 802) "Radioactive Waste Shipment Prior Notification and Manifest Form".

This prior notification of waste shipment must be telecopied to the South Carolina Health Department (Fax # 803/734-4588 or 803/799-6726) and to Chem-Nuclear at Barnwell (Fax # 803/259-7320) the same day that the waste is shipped. In addition to the telecopied prior notifications, copies of the prior notification must also be included in the shipping papers accompanying the shipment, the drivers papers, the shipping papers mailed on the day of shipment, and the Cimarron shipping records.

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3. Chem-Nuclear System's Barnwell Waste Management Facility Form #CNS-201 "Radioactive Shipment Manifest Form".

This completed form must be included with the shipping papers that accompany the shipment. The proper shipping address for shipments to Barnwell is:

Chem-Nuclear Systems, Inc.
Osborne Road
Barnwell, South Carolina

4. South Carolina Department of Health and Environmental Control Form #DHEC-803 "Radioactive Waste Shipment Certification Form".

This certification form must be signed by authorized company representatives and included in the shipping papers that accompany the shipment.

5. Instructions to truck drivers hauling radioactive waste shipments to Barnwell, South Carolina.

Have the truck driver sign the instruction sheet to show acknowledgement of the instructions. Make three copies of the instruction sheet after it is signed by the driver. The original shall accompany the shipment with the shipping papers, one of the copies is for the truck driver, one of the copies is to be mailed to the burial site, and the other copy is for our files.

6. Cimarron Form "Notice of Shipment" which includes a record of the radiation survey data for the shipment.
7. KM Form #3558-A "Shipping Memo - Cimarron Facility".
8. Load List.

A diagram is made of each load to show the location of each drum in the load. A copy of this load list shall be included in the shipping papers.

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C. Distribution of shipping papers and follow-up.

After the driver signs the shipping papers acknowledging receipt of the shipment and the driver instructions, make copies to provide the following distribution:

1. Mail a complete set of the required shipping papers to the burial site;
2. Send a complete set of the papers in an envelope addressed to the burial site with the shipment;
3. Retain a complete set of the papers for our shipping record files; and,
4. Provide the driver with a copy of the Notice of Shipment, the burial site shipment forms (manifest), the certification forms, prior notification forms, and the driver instructions.

Any shipment for which acknowledgement is not received from the burial site within 20 days after transfer shall be investigated by the shipper. The investigation shall include tracing the shipment and filing a report with the NRC Regional Office within two weeks of completion of the investigation.

VIII. NOTIFICATION, SCHEDULING, AND SHIPPING ARRANGEMENTS

Shipment schedule dates shall be established with Tri-State (800)872-8768 (Radioactive Shipping Department).

After the shipping arrangements are made with Tri-State, call the Barnwell Schedule Planning Department (803)259-3577 or (803)259-3578 to obtain a Shipment Identification Number and to schedule the shipment. The scheduling will require the shipping date, the volume Ft.³, and the estimated arrival date.

On the same day that the shipment departs the facility, the prior notification form must be telecopied to the South Carolina Health Department (Fax #803/734-4588 or 803/799-6726) and to the Chem-Nuclear at Barnwell (Fax #803/259-7320).

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A Prior Notification Plan can be cancelled or changed at any time by telephone. Any changes that affect the shipment's volume and/or arrival date at the Barnwell Facility must be called in. The telephone number to call for updates are:

South Carolina Department of Health
(803)734-4632 (during and after working hours)
Chem-Nuclear's Barnwell Scheduling Office
(803)259-3577 (during and after working hours)

IX. QUALITY ASSURANCE PROGRAM

As used in this procedure, "Quality Assurance" comprises all those planned and systematic actions necessary to provide adequate confidence that improper shipments of radioactive material may not occur and that the waste shipment containers will perform satisfactorily in service.

A. Container Design and Procurement Control.

All of the Cimarron Facility LSA waste will be packaged in 55 gallon steel open head drums. The drums will be new 17-H drums.

Even though DOT Regulation 173.425 (b) does not require specification packaging for LSA shipments consigned as exclusive use shipments, procurement documents for purchase of additional new drums for LSA waste shall require the drums to meet DOT 17-H specifications. The design specifications have already been determined and approved in DOT Regulation 178.118.

B. Inspections, Identification Control, and Records.

All drums to be used for LSA waste shall be identified by an assigned drum number from the time of the inspection of the empty drum on through shipment to burial. All packaging and shipping records shall be tied to the assigned drum number.

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1. Each drum shall be inspected by the Decontamination Supervisor and assigned a drum inspection number before placing any waste material in the drum. Drums found to be satisfactory shall be identified by writing "OK", the assigned drum number, the date and initial of the inspector on the side of the drum near the top chime with a metal marking paint pencil of a contrasting color. Any drum that does not pass inspection shall be identified by writing "Rejected" on the side of the drum. The rejected drums shall be returned to the vendor.

The Decontamination Supervisor who inspects the drum shall maintain an inspection log. The logs shall show the drum inspection number, initial of the inspector, date of inspection, whether "OK" or "Rejected", the reason for the rejection, and the subsequent drum shipping number.

The new drums shall be inspected for conformance to the procurement specifications by assuring that:

- a. "DOT 17-H" is stamped into the bottom of the drum,
 - b. the drums are equipped with undamaged heavy duty closure rings (12 gauge) with a 5/8 inch or larger bolt,
 - c. the drums are free of dents or other defects except for superficial marks,
 - d. the rubber seal gasket is in place in the lid,
 - e. the weld laps have been rolled and welded with no wrinkles or gaps,
 - f. the bottom edges have been rolled tight and smooth, and
 - g. no rust pitting is noted that would cause weakness in the metal.
2. The second inspection consists of the drum packaging inspection. The Decontamination Supervisor who closes up the drum shall inspect the drum to assure that the material is properly packaged, that there is no free standing liquids, and that cemented liquids are hard enough to be free standing monoliths.

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In addition to the drum inspection number written near the top chime, each drum shall be stenciled with paint of a contrasting color on the top and on the side of the drum in letters at least 0.75" in height to show the following information:

Drum No. _____
_____ Grams U-235 (or Th)
_____ Lbs. Gwt.

Radioactive LSA
Class A Unstable

Inspected by: _____

Date Inspected: _____

The drum number shown with this stenciling is the drum shipping number and may be a different number than the drum inspection number written above near the chime. The inspected by, with this stenciling, is for the initial of the Decontamination Supervisor who makes the packaging inspection when the filled drum is closed up. No separate log record will be required for the drum packaging inspection.

3. The third inspection consists of a shipment inspection by Health Physics personnel. Each drum of waste shall be inspected by Health Physics personnel prior to the drums being loaded into the shipping van to assure that:
 - a. the drum is in unimpaired physical condition, except for superficial marks;
 - b. each drum closure, including the gasket, is properly installed, secured, and free of defects;
 - c. external radiation and contamination levels are within the allowable limits; and,
 - d. the drums are conspicuously and durably marked as required by this procedure.

The signature of the Health Physics Technician on the Notice Of Shipment form will serve as a record that this inspection was conducted as required.

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4. The fourth and final inspection consists of a shipment inspection after the shipment is loaded and ready for departure. The Decontamination Supervisor and the Administration & Accountability Supervisor shall inspect the loaded van on the day of shipment to assure that:
 - a. The lock nuts on the lock rings have been tightened properly,
 - b. the drums have not been damaged in loading, and,
 - c. the drums are loaded snug enough and proper shoring is in place to prevent movement of the drums during shipment. No record of the inspections is required.

C. Container Content Control.

To avoid fissile class requirements the U-235 content of all items to be packaged for shipment must be determined to assure that 15 grams U-235/drum is not exceeded.

1. The U-235 content of LSA waste shall be determined by:
 - (a) Isotopic analysis by outside analytical service company(s), or
 - (b) Non-destructive analysis of bags of waste by Health Physics personnel, or
 - (c) Alpha survey of the surface of contaminated items by Health Physics personnel, or
 - (d) Solution sample analysis by Health Physics personnel prior of solidification.
2. The Administration and Accountability Supervisor:
 - (a) Provides instructions for the packaging and weighing of U-plant nuclear material to be shipped in accordance with special instruction and procedures;

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- (b) Correlates analytical data with tally forms and calculates the element and isotopic content of all waste shipments;
 - (c) Submits to the Health and Safety Supervisor a shipping memo listing all information as required by special instructions to include as a minimum the container number, material type and enrichment, and gross and net weight for all waste shipments.
3. The Health and Safety Supervisor:
- (a) Reviews the shipping memo submitted by the Administration and Accountability Supervisor for calculation accuracy and completeness;
 - (b) Where applicable, check weighs material with the assistance of the Administration and Accountability Supervisor to determine the correctness and accuracy of reported data;
 - (c) Utilizing the weight and analytical data submitted, along with the accuracy data developed from the sampling technique, calculates the limit of error for the shipment.
4. The Decontamination Supervisor:

To assure compliance with NRC 61.56 waste form classification, the Decon Supervisor in charge of cementing LSA liquid waste shall be responsible for assuring that the liquid is properly mixed with one sack of cement per 8 to 10 gallons of water. The Supervisor is also responsible for holding the drum of cemented liquid for at least 72 hours before inspection and installing the lid to assure that:

- (a) The hardness is sufficient to meet the free standing monolith requirements for Class A Unstable waste;
- (b) There is no free standing liquid in the drum; and,

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(c) The waste is not generating fumes harmful to persons handling, transporting, or disposing of the waste.

Records of analytical results and calculations used to determine container content shall be maintained by the Health Physics Supervisor and the Administration & Accountability Supervisor in compliance with accountability procedures KM-NU-15-2.

D. Audits.

A quarterly audit shall be performed by a Corporate Regulatory Compliance Inspector to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program. Audit results shall be documented and reviewed with management having responsibility in the area audited. Follow-up action, including re-audit of deficient areas, shall be taken where indicated.

E. Training.

All persons involved in waste packaging and shipping shall attend training sessions on this procedure at least annually and promptly each time this procedure is revised.

CIMARRON CORPORATION

Date _____

P.O. BOX 318 • CHEBERT, OKLAHOMA 73028

Shipment No. _____

INSTRUCTIONS TO TRUCK DRIVERS HAULING RADIOACTIVE
WASTE SHIPMENTS TO BARNWELL, SOUTH CAROLINA.

This shipment is in a "sole use" trailer to be used exclusively for this shipment only. The load must not be off-loaded at any point in route to its assigned destination. No other material may be loaded in with this material. The trailer must be delivered to the consignee shown on the shipping papers with the tamper proof seals on the trailer doors still intact.

The truck drivers hauling radioactive waste into South Carolina are responsible for notifying the South Carolina Department of Health and Environmental Control 803-253-6497 (during and after business hours) of any variance, occurring after departure, from the shipper's notification of primary routes in South Carolina and estimated date of arrival.

In case of a transportation accident, rescue and lifesaving may be done with little fear of the hazards from the low-level radioactivity in this load of waste. DO NOT DELAY RESCUE EFFORTS!

After needed rescue, lifesaving, or first aid:

1. Contact the carrier and shipper;

Cimarron Corporation 405/232-5471 (day or night)
Tri-State Motor Transit Co. 800/641-7591

2. Contact the local law enforcement agency:

Tell the police of the accident with spillage of "Low Specific Activity" (LSA) uranium contaminated waste. Ask them to notify the state health department. Give them the location of the accident site and tell them of any injuries to persons.

3. If a collision or vehicle upset results in fire, the cargo will not explode, but a vehicle fire could spread to combustible material in spilled cargo. Bystanders and fire fighters should be instructed to stand upwind of the spill and 25 feet or more from it. Undamaged containers laying on the road may be moved to the side of the road.

Please cooperate with civil authorities and carrier's and shipper's personnel who arrive at the scene. Follow their health-safety instructions for checking for possible uranium contamination of your clothing or body.

The contamination in this waste is relatively harmless and simple washing methods will remove it. Please be assured that your exposure to this material will be relatively harmless, particularly if you follow instructions.

A. W. Norwood
Standby Operations Manager

Truck Driver's Signature _____

Date _____

Showing acknowledgment that he understands the

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
 Radioactive Waste Shipment Prior Notification and Manifest Form

[Failure to Complete All Entries Will Result in Return of Form and Constitutes Noncompliance.]

See Reverse Side for Instructions		
1. Name and Address of Shipper/Generator:	2. Person Responsible for Waste Shipment: a) Name: b) Title: c) Telephone: ()	
3. Radioactive Waste Transport Permit No.	4. Shipment Identification No.:	
5. Location from which waste will be shipped:	6. Name and Address of Consignee:	
7. Scheduled Date of Departure of Shipment:	8. Estimated Date of Arrival of Shipment:	
9. Carrier:	10. Trailer No. & Owner: (if available)	11. Type Transport Vehicle:
12. Routes shipment will follow in State of South Carolina (Be Specific):		
13. Type Package or Cask Model No.:	14. Type Container in Cask:	15. Package or Cask Spec.:
16. Complete Waste Description (Be Specific):		
17. Physical & Chemical Form:	18. Total No. of Packages:	19. Prominent Radionuclides:
20. Total Curies:	21. Waste Class & Stability:	22. Total Cubic Feet:
23. DOT Sub Type:	24. DOT Class. & Hazard Class UN No.:	25. Hwy. Route Controlled: (Large Quantity) <input type="checkbox"/> Yes <input type="checkbox"/> No

CERTIFICATION

I hereby certify on behalf of the above-named shipper/generator to the South Carolina Department of Health and Environmental Control that the information provided herein is complete and correct to the best of my knowledge; and that the shipper/generator has complied with all the provisions as required by Act No. 429 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, and Department Regulation 61-62.

Date _____

Typed Name _____

Signature of Consignee's Authorized
Representative _____

CONSIGNEE ACKNOWLEDGMENT

This acknowledges to the South Carolina Department of Health and Environmental Control that the above-described radioactive waste shipment was received.

Date of Delivery _____

Signature of Consignee's Authorized
Representative _____

Typed or Printed Name and Title _____

DHEC 802 (Rev. 10/84)

(Copies of this form may be reproduced locally as needed)

FORM RHA-CT
(5/80)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
Radioactive Waste Shipment Certification Form

General Instructions and Information: This is a two part form to be used by shippers and carriers of radioactive waste. The certifications contained herein satisfy the requirements Section 13-7-150, of Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act. This certification along with a copy of the prior notification form shall accompany each shipment of radioactive waste into and within the State of South Carolina. The shipper is to complete his portion of the form and present it to the carrier as part of the shipping documents. Upon receipt, the carrier shall complete his portion of the form. Upon delivery of the shipment to the consignee, a copy of this certification form, and a copy of Prior Notification and Manifest form with the consignee acknowledgement, shall be returned to the Department.

Part I: Shipper's Certificate of Compliance

1. Name of Shipper and Address: Telephone No. ()	2. Shipment Identification No.
	3. Transport Permit No.

In compliance with Act No. 499 of 1980, the South Carolina Radioactive Waste Transportation and Disposal Act, I hereby certify on behalf of the above-named shipper to the South Carolina Department of Health and Environmental Control that the above-named shipper has complied with all provisions of Act No. 499 of 1980, and all applicable laws and administrative rules and regulations both State and Federal, regarding the packaging, transportation, storage, disposal and delivery of such wastes. I further certify that this shipment of radioactive waste has been inspected within 48 hours of the time of departure and that no items of non-compliance with applicable laws, rules or regulations were found.

Date _____

Typed Name and Title of Agent of Shipper _____ Signature _____

Part II: Carrier's Certification

1. Name of Carrier and Address: Telephone No. ()	2. Shipment Identification No.
	3. Transport Trailer No.
4. Scheduled Date of Departure of Shipment:	5. Estimated Date of Arrival of Shipment:

Certification is hereby made to the South Carolina Department of Health and Environmental Control that: (a) the shipper has provided the carrier with a copy of the shipment manifest, the certificate of compliance, and the routing instructions; (b) the shipment of radioactive waste has been properly placarded for transport according to applicable U.S. Department of Transportation Regulations; (c) all shipping papers originated or reproduced by the carrier have been properly executed; (d) the transport vehicle has been inspected according to applicable State and Federal regulations within the prescribed intervals and that all safety and operational components are in good working order and meet the requirements of regulations; (e) all drivers who will operate the vehicle within the State of South Carolina are qualified to transport hazardous materials as specified by applicable U.S. Department of Transportation regulations; (f) the Department shall be immediately notified of any variance, occurring after departure, from the shipper's notification of primary routes in South Carolina and estimated date of arrival; (g) all applicable laws and administrative rules and regulations, both State and Federal, regarding the transportation of radioactive wastes will be complied with.

Date _____

Typed or Printed Name and Title _____ Signature _____

NUCLEAR MATERIAL HANDLING REPORT

1. REPORT NO. (10)
 2. DATE (11/07/91)
 3. REPORTING OFFICE (222)
 4. REPORTING OFFICER (1234)
 5. TITLE (5678)
 6. CLASSIFICATION (910)
 7. SECURITY CLASSIFICATION (1111)
 8. SECURITY CLASSIFICATION (1212)
 9. SECURITY CLASSIFICATION (1313)
 10. SECURITY CLASSIFICATION (1414)
 11. SECURITY CLASSIFICATION (1515)
 12. SECURITY CLASSIFICATION (1616)
 13. SECURITY CLASSIFICATION (1717)
 14. SECURITY CLASSIFICATION (1818)
 15. SECURITY CLASSIFICATION (1919)
 16. SECURITY CLASSIFICATION (2020)

24. SHIPPER'S DATA			25. RECEIVER'S DATA											
NO.	SHIPPER'S NAME	SHIPPER'S ADDRESS	NO.	RECEIVER'S NAME	RECEIVER'S ADDRESS	NO.	RECEIVER'S NAME	RECEIVER'S ADDRESS	NO.	RECEIVER'S NAME	RECEIVER'S ADDRESS	NO.	RECEIVER'S NAME	RECEIVER'S ADDRESS

26. SHIPPER'S DATA												27. RECEIVER'S DATA											
NO.	SHIPPER'S NAME	SHIPPER'S ADDRESS	NO.	RECEIVER'S NAME	RECEIVER'S ADDRESS	NO.	RECEIVER'S NAME	RECEIVER'S ADDRESS	NO.	RECEIVER'S NAME	RECEIVER'S ADDRESS	NO.	RECEIVER'S NAME	RECEIVER'S ADDRESS									

IN U.S.C. SECTION 1081, ACT OF AUGUST 21, 1946 AS AMENDED BY PUBLIC LAW 85-624, TITLE I, SECTION 3121, NUCLEAR MATERIAL HANDLING REPORT. THIS REPORT IS TO BE FILED IN THE OFFICE OF THE DIRECTOR, NUCLEAR REGULATORY COMMISSION.

NOTICE OF SHIPMENT
FROM
CIMARRON CORPORATION
A SUBSIDIARY OF KERR MCGEE CORP.
P.O. Box 315 - CRESCENT, OK 73028

	company CHEM-NUCLEAR SYSTEMS	The property described below is apparent good order except as noted. Carrier and condition of contents of packages unimpaired, consigned and delivered as indicated below which said carrier (the vessel carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to the usual place of delivery of said destination. If on its own route, it is mutually agreed to be such carrier of all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Freight Bill of Lading set forth in the Official, Southern, Western and Great Lakes Freight Classification in effect on the date hereof, or the applicable water shipment or (1) to the applicable water carrier classification in effect on the date hereof, and (2) to the applicable terms and conditions of the said bill of lading. Shipper hereby agrees to the transportation of this shipment and the classification or tariff which governs the transportation of this shipment and the said terms and conditions are hereby agreed to by the shipper and accepted in full and in detail.	
	address OSBORNE ROAD - P.O. BOX 726		
	City BARNWELL		
	State SOUTH CAROLINA	Zip 29812	
Number of Drums	MATERIAL DESCRIPTION	gross wt. lbs	
	17-H 55 GALLON DRUMS CONTAINING WASTE NON-TRANSURANIC RADIOACTIVE MATERIAL WASTE RADIOACTIVE MATERIALS, FISSILE LOW SPECIFIC ACTIVITY N.O.S, UN-2912		Date of Shipment Cust. order No. Transport ID No. Shipment No. Shipping Tri-State Motor Transit Co. P.O. Box 113 - Joplin MO 64 Method Phone: 1-800-872-8768 Shipping container permit no. 17-H 55 gallon drums
	Tri-State to <u>BARNWELL, SOUTH CAROLINA.</u> "SOLE USE VEHICLE"		<input type="checkbox"/> Dep. Uranium <input type="checkbox"/> Plutonium <input type="checkbox"/> Nat. Uranium <input type="checkbox"/> Other <input type="checkbox"/> Enriched Uranium <input type="checkbox"/> Other
TRAILER SEAL NUMBER	stability class UNSTABLE	waste form class CLASS A	physical form SOLID WASTE
	activity of shipment in mCi		radioactive label applied RADIOACTIVE LSA
	fissile class transport index FISSILE EXEMPT		chemical form OXIDES
	hazard class UN-2912		radionuclide SEE MANIFEST
OFF-SITE SHIPMENT SURVEY DATA	fixed contamination Probe Area	d/m-60 cm ²	Trailer surface dose rate wrem/hr.
	smearable contamination	d/m-100 cm ²	Trailer dose rate @ 6ft. wrem/hr.
	Truck & Trailer identification No. Tractor # _____ Trailer # _____		Dose rate in Truck cab wrem/hr.
DRUM NUMBERS			date
	IN CASE OF EMERGENCY CALL A. W. Norwood (405)232-5471		By (Health Physicist)

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport according to the applicable regulations of the Department of Transportation and NEC.

If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "trailer's or shipper's weight".

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of bulky specifically agreed to by the shipper is to be not exceeding

CIMARRON CORPORATION Date _____

BY A. W. NORWOOD Driver's Signature

(1) ORIGINATOR NAME
 FACILITY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 CONTACT _____ PHONE () _____
 EMERGENCY RESPONSE CONTACT _____ PHONE () _____
 (2) BILL TO: _____

Operated by CHEM-NUCLEAR SYSTEMS, INC.
 PO Box 726, Barnwell, South Carolina 2981
 (803) 259-1781
RADIOACTIVE SHIPMENT MANIFEST FORM

(3A) RADIOACTIVE WASTE TRANSPORTATION PERMIT NO. _____

(4) USE THIS NUMBER ON ALL CONTINUATION PAGES SHIPMENT I.D. NUMBER PAGE _____ OF _____
 (3B) NUMBER OF GENERATORS _____

PHONE _____ SHIPPING DATE _____
 SHIPMENT TYPE _____ SHIPMENT SURFACE EXPOSURE _____ mR/Hr
 CASK IDENTIFICATION NO. _____ USA / /
 SHIPMENT NO. _____ LINER TYPE _____
 LINER SERIAL NO. _____
 DRIVER SIGNATURE _____ DATE _____

TOTAL FOR EACH CLASS		PROPER SHIPPING NAME & HAZARD CLASS (PER 49 CFR 172.101)	I.D. NUMBER	Reportable Quantity
NO. OF PACKAGES	WEIGHT (POUNDS)			
		Radioactive Material, empty packages	UN2908	
		Radioactive Material, flammable, n.o.s. - Radioactive Material	UN2918	
		Radioactive Material, low specific activity, n.o.s. - Radioactive Material	UN2912	
		Radioactive Material, n.o.s. - Radioactive Material	UN2982	
		Radioactive Material, limited quantity, n.o.s. - Radioactive Material	UN2910	
		Radioactive Material, special form, n.o.s. - Radioactive Material	UN2974	
		Radioactive Material, instruments and articles - Radioactive Material	UN2911	
		Other (Specify) _____		

(7) SHIPMENT TOTALS						(8) TOTAL SNM				
Disposal Volume (liters)	Total No. of Packages	ACTIVITY (DCFR29.311) Millicuries					Source (Pounds)	Isotope	Grams	No. Package
		All Isotopes	Tritium	C-14	Tc-99	I-129				
							U-233			
							U-235			
							Total			

(12) WASTE DESCRIPTION _____ (13) PHYSICAL FORM _____
 (16 B) Yes No This waste(s) must be disposed in South Carolina Department of Health and Environmental Control Approved Structural Overpacks to meet stability requirements.
 (17) Yes No THIS VEHICLE IS CONIGNED EXCLUSIVE USE. LOADING AND UNLOADING MUST BE ACCOMPLISHED BY CONSIGNOR OR CONSIGNEE OR HIS DESIGNATED AGENT.
 (18) IMPORTANT: This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.
 Signature _____ Date _____
 Company _____

(9) MINIMUM WASTE PACKAGE % FILL _____ (10) SOLIDIFICATION AGENT _____ (11) NUMBER AND TYPE OF CONTAINERS _____
 (14) CHEMICAL FORM _____ (15) NAME AND % OF CHELATING AGENT(S) _____ (16 A) WASTE FORM CLASSIFICATION AU AS B C

(19) Certification is hereby made to the South Carolina Department of Health and Environmental Control that this shipment of low level radioactive waste has been inspected in accordance with the requirements of South Carolina Radioactive Material License No. 097 as amended, and the Nuclear Regulatory Commission's License No. 12-13536-01 as amended, and the effective Barnwell Site Disposal Criteria within 48 hours prior to shipment, and further certification is made that the inspection revealed no items of non-compliance with all applicable laws, rules and regulations.
 Date _____ Signature _____
 Title and Organization _____
 Telephone No. () _____

DISPOSAL SITE COPY
 Form No. CNS-201 (1-90)
 SEE INSTRUCTIONS ON REVERSE SIDE FOR FILLING OUT THIS FORM

CNSI USE ONLY

- This material meets all license requirements.
- This material was disposed of in accordance with license.
- Discrepancy _____

Crane Forklift
 Shielded Personnel Barrier
 Overpack S/N _____
 Overpack Lid S/N _____
 Other _____

Arrival Date _____ Arrival Survey No. _____
 Date/Time Buried _____ H.P. Initial _____
 Trench No. _____ Location Code _____
 Waste Class Code _____
 Trench No. _____ Location Code _____
 Waste Class Code _____
 Personnel Exposure _____

Date _____
 Authorized Signature _____ Title _____