State of Connecticut Department of Energy and Environmental Protection

Radiation Division

RCP – 403

Responding to Incidents at a Solid Waste and Metal Recycling Facilities Equipped with Radiation Monitoring Systems

Prepared by: _____ Date: 6/26/2024

Reviewed by: _____ Date: June 26, 2024

Approved by _____ Date: 6/26/2024

Revision	Date	Description of Changes
3	03/2021	• Added/ modified NOTE before 6.3.10 and 6.3.13 to address Pu-239 • Added Lu-177 and Th-227 to Attachment 7 (Approved Medical Isotopes) • Added NOTE to Attachment 1 and 2 to check for current version of form. • Updated Attachment 1 and 2 to reflect current version of special permit. • Editorial changes • Added clarification on appropriate dead time limits for detection equipment • Added Attachments 7 and 8, job aids for survey of hot loads and for special permits • Deleted old Attachment 6 (Multi-media checklist) • Added generic term for Identifinder -RIID
4	6/30/2024	Formatting changes throughout for consistency with Agreement State Procedures, added NRC reporting criteria, updated website link in Section 5.4, added Office Director to Section 6.1, and combined attachment 1 and 2 with link for DOT SP forms and updated Attachment numbers throughout

TABLE OF CONTENTS

ATTACHMENTS

1. PURPOSE

The purpose of this procedure is to provide standard guidance to Radiation Division personnel when responding to radiation incidents involving solid waste and scrap metal facilities.

2. SCOPE

This procedure applies to all Radiation Division personnel when responding to an incident at a solid waste or scrap metal facility involving the potential presence of radioactive material.

3. REFERENCES

3.1 Connecticut General Statutes, Chapters 446 and 446a.

3.2 Regulations of Connecticut State Agencies, Sections 19-24-1 through 19-24-14.

3.3 DOT instructions for use of Special Permit DOT-SP 11406 (Waste) – (available at https://www.crcpd.org/page/Transportation)

3.4 DOT instructions for use of Special Permit DOT-SP 10656 (Metals) (available at https://www.crcpd.org/page/Transportation)

3.5 FRMAC Monitoring and Sampling Manual, Vol. 1, Rev 03, April 2019

3.6 NRC Training Powerpoint – H122 Gamma Spectroscopy Overview 2011 (ADAMS ML11229A699)

4. DEFINITIONS AND ABBREVIATIONS

4.1 See Connecticut General Statutes, Section 22a-151.

4.2 See Agency Administrative Regulations, Sections 19-24-1 through 19-24-14.

4.3 See National Council on Radiation Protection Composite Glossary.

5. GENERAL

5.1 Equipment

1. Ludlum 14C kit (or equivalent)
2. RIID (RadioIsotope Identifier) – eg - Identifinder
3. Suitable PPE (reflective vest, safety glasses, hardhat, safety shoes, face mask, gloves – as appropriate)

4. PeakEasy gamma spectroscopy software

5.2 Precautions and Limitations

1. Ensure PPE is appropriate based on hazard assessment.
2. Dead time considerations for in-situ gamma spectroscopy:
   If using the Identifinder, measurement should be between the arrows on the display. This may be equivalent to 15 – 20% deadtime as shown in PeakEasy results. Equipment similar to Identifinder may have their own dead time measurement criteria. If there is no instrument specific guidance: 1) <10% dead time (Ref. 3.6) and 2) maximum exposure rate during survey is 3 mr/hr (pg 16 of Ref. 3.5).

5.3 Responsibilities

1. Completion of any record required by this procedure.

5.4 Prerequisites

1. Authorization from CRCPD to sign DOT Special Permits – authorized individuals can be reviewed on CRCPD web site at https://crcpd.org/transportation/ or review CRCPD Directory of Personnel Responsible for Radiological Health Programs
2. Ensure all instruments used are calibrated and functioning properly.
3. PeakEasy software is available for isotopic analysis of gamma spectrum.

5.5 Records

1. Attachments 2 through 7 are records which are maintained by the Radiation Division.

6. PROCEDURE

6.1 **Immediate Action: –** *Performed by Office Director or Supervising Physicist.*

6.1.1 Upon receipt of a call for assistance, record/obtain the following administrative information if available.

6.1.1.1 Date and Time call was received.

6.1.1.2 Name and Location of Facility

6.1.1.3 Name, title and telephone number of contact

6.1.1.4 Incident Information: Radiation monitor reading (& background), any handheld instrument measurements/isotopic identification by facility personnel, name & type of carrier, origin of material (town, sole use, out of state, etc.).

6.1.2 Notify On Call Duty Officer or other Radiation Control Physicist.

6.1.3 If warranted, notification will be made to appropriate state and federal agencies including the Nuclear Regulatory Commission (NRC) in accordance with RCP 904.2 Incident Response (Section 6.6).

6.2 **Response Actions:** - *Performed by authorized Radiation Control Physicist.*

6.2.1 Obtain DEEP/RD Incident Number from Incident Log Book.

6.2.2 Refer to Attachment 3 for the appropriate response based on information obtained from the Facility and/or Supervising Physicist.

6.2.3 The Radiation Control Physicist will be dispatched to the facility if one or more of the following conditions are met:

6.2.3.1 The dose on the external surface of the vehicle exceeds 50 mr/hr or dose to any occupied space (cab areas) exceeds 2 mr/hr.

6.2.3.2 An isotopic identification has been performed and the material is not indicative of one of the approved medical radioisotopes listed in Attachment 5.

6.2.3.3 The Supervising Physicist has determined that a response is warranted.

6.2.4 If the information obtained from the facility or the Supervising Physicist does not warrant a dispatch of a Radiation Control Physicist, notify the facility that the following options are available:

> *NOTE*
> A Waste Tipping Permit issued by the DEEP Materials Management Bureau must be in effect for the location at which the load will be tipped and segregated.

6.2.4.1 Option 1 – A radiation consultant is hired to disposition the radiation alarm.

- Notification of the results is made to the Radiation Division after disposition of the radiation alarm.

6.2.4.2 Option 2 – A dose reading is obtained off of the external surface of the vehicle and a DOT Special Permit is requested and issued during normal business hours to return the load to the originator for disposition.

- Notification of the results is made to the Radiation Division after disposition of the radiation alarm.
- If the conditions for a DOT Special Permit are met, issue a DOT Special Permit utilizing DOT instructions for DOT Special Permits. DOT instructions are available from the CRCPD website. (Attachment 6 contains actions for consideration when preparing a Special Permit.)
- Obtain a DOT Special Permit Number.

6.2.4.3 Option 3 – Facility operator obtains detailed radiation information utilizing radionuclide identification detector(s) and emails results to the Radiation Division for review and analysis during normal business hours.

- A Radiation Control Physicist will review information obtained to determine the radioisotope.
- The Radiation Control Physicist should analyze the results from the facility utilizing gamma spectroscopy software.

- If the radioisotope identified is one of the approved radioisotopes for normal disposal as listed in Attachment 5, notify the facility and the Supervising Physicist of the results and that the material is allowed to be processed without any radiological concern.
- If the radioisotope is not identified as one of the approved radioisotopes for normal disposal as listed in Attachment 5, notify the facility and the Supervising Physicist of the results that the material cannot be released and the following options are available.

  Option 1 – A radiation consultant is hired to disposition the radiation alarm.

  Notification of the results is made to Radiation Division after disposition of the radiation alarm.

NOTE
DEEP-RD Personnel should obtain site supervisory approval for segregation and confirm whether site, hauler or material source will take possession and responsibility for segregated material before providing assistance in the tipping and segregation of the load.

  Option 2 – DEEP Radiation assists in the identification and segregation of the radiation alarm source during normal business hours.

  After identification and segregation is performed, a radiation consultant/ radioactive waste broker dispositions the radiation source.

  Notification of the results is made to Radiation Division after disposition of the radiation alarm.

NOTE
Attachment 7 contains guidance which may be useful for performing a hot load survey.

6.3 **Response Actions for Dispatching to a Facility:** - *Performed by Radiation Control Physicist.*

6.3.1 Request backup from supervisor, if necessary.

6.3.2 If necessary, contact facility for additional information, including directions, truck identification etc.

6.3.3 Proceed to facility at a reasonable speed for road conditions and situation.

6.3.4 Notify facility upon arrival for any additional instructions.

6.3.5 Wear all appropriate PPE as required by the DEEP and any additional requirements by the facility.

6.3.6 Survey outside of vehicle, and cab area using appropriate instrumentation. Use an Ion Chamber or other Energy Compensated Detector, to document dose rates on side of vehicle and cab area.

6.3.7 Document origin: Transfer station, curbside pick-up, front loaded dumpster service, sole use dumpster from within Connecticut or from out of state.

6.3.8 Perform a 3-minute minimum background count with a portable gamma ray spectroscopy device.

6.3.9 Perform a 3-minute minimum isotopic identification through the truck side with a portable gamma ray spectroscopy device.

> *NOTE:*
>
> An isotopic identification confidence level of ≥ 7 must be achieved with a portable gamma ray spectroscopy device to ensure accurate identification. An isotope identification below a confidence level of 7 may be analyzed using gamma spectroscopy software to determine the radioisotope. If Pu-239 is indicated, the spectrum shall be reviewed to consider Lu-177 as the source.

6.3.10 Allow an approved facility to tip and process the waste as normal non-radioactive waste, if the radioisotope is identified as one of the approved medical isotopes from Attachment 5, and the contact dose rate on the external surface of the vehicle does not exceed 50 mr/hr. Authorization by a Supervising Radiation Control Physicist is required to tip and process any other radioisotope.

NOTE

A Waste Tipping Permit issued by the DEEP Materials Management Bureau must be in effect for the location at which the load will be tipped and segregated.

6.3.11 If Cs-137, Ir-192, Co-60, or Ra-226 is identified consider the possibility of a large, shielded source. If there are labels indicating Am-241, Sr-90, or other potential sources with unexplained elevated radiation levels consider that there is source that cannot identified using gamma spectroscopy (beta/positron emitter, neutron source, etc) obtain the authorization of the Supervising Radiation Control Physicist and site supervisory approval prior to tipping the load.

NOTE

DEEP-RD Personnel should obtain site supervisory approval for segregation and confirm whether site, hauler or material source will take possession and responsibility for segregated material before providing assistance in the tipping and segregation of the load.

6.3.12 Perform a second 3-minute minimum background count with a portable gamma ray spectroscopy device. (This ensures equipment functionality if the expected low level Cs-137 shows up in the Identifinder background spectrum.)

NOTE

If Pu-239 is indicated when using a portable gamma ray spectroscopy device, the spectrum shall be reviewed to consider Lu-177 as the source.

6.3.13 If a positive isotopic identification cannot be made, a radioisotope other than listed in Attachment 5 is found, or the contact dose rate on the external surface of the vehicle exceeds 50 mr/hr, or greater than 2 mr/hr in the cab area, contact a Supervising Radiation Control Physicist for further instructions.

- If the load will be returned to its origin and the conditions for a DOT Special Permit are met, issue a DOT Special Permit utilizing DOT instructions for DOT Special Permits.

6.3.14 If the originating facility is registered with the DEEP, Radiation Division, a copy of the Special Permit shall be attached to their file (eg – ICM, IBM Case Manager).

6.3.15 At the location where segregation will be performed:

6.3.15.1 Don appropriate PPE based on Hazard Evaluation.

6.3.15.2 On the tipping floors: make sure equipment operators are aware of your presence.

6.3.16 During the segregation of radioactive material: Keep aware of vehicles and equipment operating near you.

6.3.16.1 When an item is identified, place it in a large bag and move it away from the work area to keep the background low.

6.3.16.2 **NOTE:** If a large volume of waste is segregated (more than two large bags) arrange with the hauler to have a suitable small dumpster delivered for storing the waste.

6.3.16.3 Continue surveying until no material over twice background can be found.

6.3.16.4 Survey waste container (dumpster, trailer or truck) to insure that no detectable radioactive material remains.

6.3.16.5 Survey segregated material for highest contact, one foot and three foot readings. Perform a 3 min minimum isotopic analysis.

6.3.16.6 Allow the segregated material to enter the regular waste stream if the condition of 6.2.4.3.1 can be met.

6.3.16.7 Ensure the bag is labeled with isotope, dose/rate, date, and surveyor's initials.

6.3.16.8 Arrange for safe storage of the segregated material for decay, if appropriate, or until a waste broker or consultant can be hired to disposition the material.

6.3 **Reporting** – *Performed by Radiation Control Physicist.*

6.4.1 Complete a "Radiation Control Incident Report" (Attachment 2) for the incident.

6.4.2 Attach a copy of the PeakEasy spectrum results to the report.

> *NOTE*
>
> Per DOT SP-11406, "radioactively contaminated household wastes are not regulated in transport by DOT under its hazardous material regulations".

6.4.3 After review by the supervising Radiation Control Physicist save an electronic copy in D:\Radiate\Share files\Duty in the current year incident folder, with the file name (RPTyyx###.rcp) where 'yy' is the current year, '###' is the assigned incident number, and 'rcp' is the Radiation Control Physicist's initials. Place a paper copy in the current year's incident logbook.

> *NOTE*
>
> Special Permit forms can be downloaded from the CRCPD website as PDFs with fill-in fields. This form can be e-mailed (versus faxed) to CRCPD via bhirschler@crcpd.org.

6.4.4 Complete and file any DOT Special Permits issued utilizing the DOT Special Permit Instructions. If a DOT Special Permit was issued and segregation occurs with DEEP oversight, FAX or Email results to personnel listed on DOT Special Permit Form.

6.4.5 It is the responsibility of the issuing Radiation Control Physicist to perform any follow-up activities regarding final disposition of the material and reporting to the Nuclear Regulatory Commission as required.

ATTACHMENT 1
DOT Special Permits

The most current version of the DOT Special Permit Forms can be retrieved from the Conference of Radiation Control Program Directors (CRCPD) website: https://crcpd.org/transportation/

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ATTACHMENT 2
RADIATION CONTROL INCIDENT REPORT

REPORT #: EVENT DATE AND TIME:
DOT Exemption:

LICENSEE: LICENSE #:
ADDRESS OF LICENSEE:

INCIDENT LOCATION:
AND PHONE#:

PARTIES INVOLVED: JOB TITLE:

INSTRUMENTS USED AND CALIBRATION DUE DATES:

MFG	Model	Serial	Cal Due	BKG

ISOTOPE(S): ACTIVITY:

N.R.C. NOTIFICATION:

OVEREXPOSURE:

PERSONAL INJURY:

RELEASE OF RADIOACTIVE MATERIAL > ATTACHMENT B quantities:

FACILITY DAMAGE:

LICENSE LOSS OF WORK TIME:

LICENSE VIOLATION:

OTHER FEDERAL, STATE OR MUNICIPAL AGENCIES INVOLVED:

TOTAL MAN REM. RECEIVED:

DESCRIPTION OF OCCURRENCE:

IMMEDIATE ACTIONS:

IMMEDIATE RESULTS:

SECONDARY ACTIONS:

SECONDARY RESULTS:

FOLLOW-UP ACTIONS:

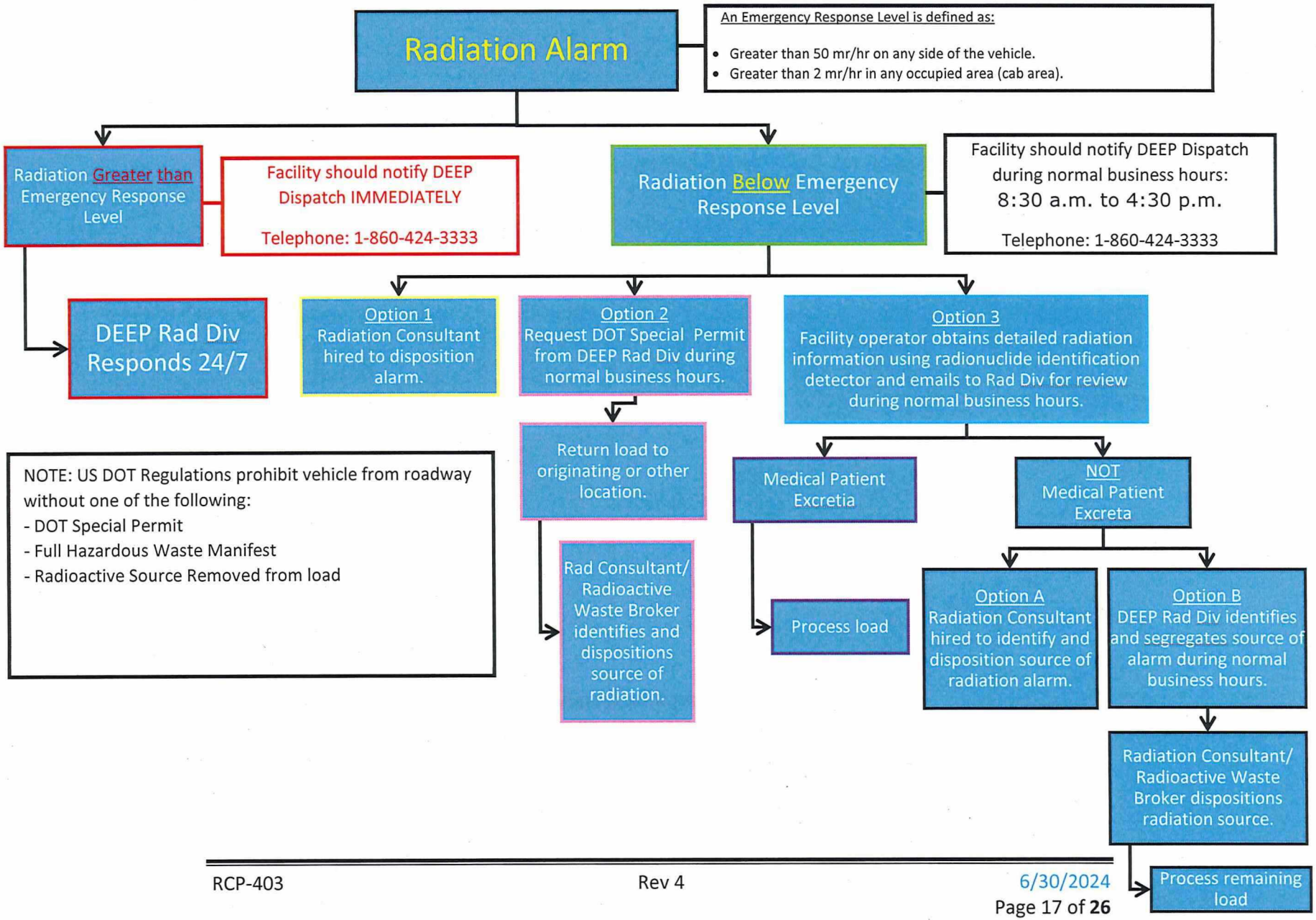
FOLLOW-UP RESULTS:

FINAL DISPOSITION: This incident is:

SUBMITTED BY: _____ Date:_____

REVIEWED BY: _____

Attachment 3 DEEP Radiation Division Waste Incident Response Decision Chart



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FOR LAW ENFORCEMENT CSPD BROADCAST

VIA: ☐ Fax ____-____-_____ ☐ Email _____
☐ Phone ____-____-____ ☐ Other _____

TO: All Connecticut DMV and CSP Truck Squads

FROM: Connecticut DEEP, Radiation Division

SUBJECT: Notification of Radioactive Shipment Under DOT Special Permit

This is to advise all enforcement personnel that a special permit to ship radioactive materials has been issued under USDOT SP 11406 or SP 10656.

☐ DOT-SP 11406 ___-___-___-___ or ☐ DOT-SP 10656 ___-___-___-___

Carrier Name: _____

Vehicle Make: _____

Vehicle Registration(s)_____

Date and Time Issued _____(Use 24 hour time)
Expiration Date and Time_____|(Use 24 hour time)

Route:_____
_____

If vehicle is encountered on any other highways, during this period, please notify DEEP at 860-424-3029 during business hours or 860-424-3333 on nights and weekends

Name of DEEP Official: _____
BROADCAST AUTH: _____

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ATTACHMENT 5

Approved Medical Radioisotopes in solid waste allowed for incineration.

Isotope	Half-Life
Ga-67	3.62 Days
I-123	13.27 Hours
I-131	8.02 Days
In-111	2.8 Days
Tc-99m	6.01 Hours
Zr-89	78.41 Hours
Ra-223*	11.44 Days
Lu-177*	6.73 Days
Th-227*	18.7 Days

*- The Identifinders may mis-identify: 1) Ra-223 and Th-227 because they are in the U-235 decay chain and 2) Lu-177 which has a gamma spectrum similar to Pu-239. Both U-235 and Pu-239 are fissile isotopes but Ra-223, Th-227 and Lu-177 are not.

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Attachment 6 Job Aid - Special Permit Processing

1. Prerequisites
   a. Material/ info needed
      i. Current Special Permit form (https://www.crcpd.org/page/Transportation), either:
         1. US DOT Special Permit SP 10656 re: scrap for recycling or
         2. US DOT Special Permit SP 11406 re: waste for disposal
      ii. Contact information required by the special permit
      iii. "Authorities Registered to Approve DOT Special Permit Shipments", mustard colored book from CRCPD (or https://www.crcpd.org/page/Transportation),
      iv. Radiation limits:
         1. < 50 mrem/hr on any external surface of vehicle and
         2. < 2 mrem/hr in any occupied space
2. Completion of Special Permit
   a. Special permit approval numbers can be pulled from the waste incident log. Use the next sequential number and the format CT-ST-YY-###, where:
      i. CT represents state of origin (may be a State other than CT)
      ii. ST represents state of destination
      iii. YY represents year
      iv. ### represents the sequential number of the shipment for that year between those states
         1. Eg – CT-RI-20-001,
   b. The facility the shipment is at may have partially completed the special permit. They will send a copy. For details, contact:
      i. Facility (current location of vehicle)
      ii. Shipment origin
      iii. State Radiation Control Officer(s) (to notify that shipment is coming)
   c. Identify any special conditions to the driver (eg – most direct route, no unnecessary stops, placement of special permit sign – posted on 2 opposing sides of truck)
   d. E-mail:
      i. Completed permit to facility and driver
      ii. Special permit sign – containing special permit number and "Radioactive" - must be conspicuously posted on two opposing sides of the vehicle.
   e. Send a copy of the permit to (as applicable):
      i. Applicable state radiation control officers from mustard CRCPD book
      ii. Facility
      iii. Origin
      iv. CRCPD, Office of Executive Director

3. Follow-up
    a. Destination facility will provide an assessment of the source for inclusion in incident report. Assessment may be provided by waste brokers on following page.
    b. Write up incident report

Attachment 7 – Job Aid -Performance of Hot Load Surveys

6 Prerequisites
- *6.1* Discuss with Supervisor
- *6.2* Equipment to bring (as appropriate)
  - *6.2.1* Identifinder (charged up)
  - *6.2.2* Ion Chamber or hot dog probe w/ 14C
  - *6.2.3* 14C rad detector kit
  - *6.2.4* Duct Tape
  - *6.2.5* Laptop w/ Peakeasy and multi-port connector
  - *6.2.6* PPE (may need glasses, safety shoes, Tyvek suits, gloves, etc)
  - *6.2.7* Muck boots (maybe/ maybe not)
  - *6.2.8* Appropriate respiratory protection (dust/ N95/ full-face)
- *6.3* Perform functional check with ion chamber and 14C equipment prior to departing for destination

7 Actions on arrival
- *7.1* Talk to Scale House operator (as applicable) for details
- *7.2* Put on safety vest (visibility) and other PPE as appropriate (especially if load is being tipped)
- *7.3* Use NaI detector in 14C kit or RIID to find hot spot if dose rates are too low
- *7.4* Using ion chamber or hot dog probe, identify highest dose rates in cab and around trailer. (>2 mr/hr in Cab or > 50 mr/hr outside vehicle – contact your supervisor)
- *7.5* Get RIID close enough that the rate display indicator shows you are in the acceptable range

8 If source is identified as medical waste per Attachment 6 of RCP-403 then:
- *8.1* Discuss with driver if trash is from:
  - *8.1.1* normal waste pickup (medical patient excreta) or
  - *8.1.2* hospital
    - *8.1.2.1* if hospital try to find out which one. Potential hospital violation.
- *8.2* Waste facility may:
  - *8.2.1* Allow it to be processed
  - *8.2.2* Segregate the waste onsite for decay
  - *8.2.3* Require it be removed
    - *8.2.3.1* See attached CRCPD listing for radwaste brokers. Many facilities use RSA (Paul Steinmeyer 860-228-0487 (w), 860-885-9871 (c)) for segregation and storage

9 Followup
- *9.1* Write up incident report

Radioactive Waste Broker & Decontamination Services[1]

CRCPD Notes of April, 2024

Firm[2]	Served[3]	Contact		Phone	E-mail	Mail out Leak Test Kit	Disassemble Devices	Decon/ Remediate Bldgs & Grounds	Decon Vehicles	Deal with Radium Devices	Deal with Mixed Waste	Store or Decay	Assist with Import/ Export	Calibrate Rad Meters	Provide Training	Encapsulate at Spec Form	Has QA Approval from WCS
Alaron Nuclear Services	All		PA	724-535-5777	www.nuclearsolutions.veolia.com	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Ameriphysics	E & Mid-W	Tom Hansen	TN	865-128-1957	tom@ameriphysics.com	Yes	Some	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Applied Health Physics	All Regions	Alan Riddle	PA	412-835-9555	dteprag@ahprad.com	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Yes	No	No
Bionomics	E & Mid-W	John McCormick	TN	865-120-8501	bionomicsjohn@comcast.net	No	Some	Yes	No	Yes	Yes	No	No	No	Yes	Yes	Yes
Chase Environmental	All	John O'Neil	TN	865-816-6015	joneil@chaseenv.com	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	
Curie Environmental Services	All	Scott Logan	NM	505-888-9352	scott.logan@curieservices.com	No	Some	Some	Yes	Yes	Yes	Yes	Yes	No	Some	No	
Ecology Services, Inc.	All	Michele Patterson	TN	865-766-5873	mpatterson@ecolgyservices.com	Yes				Yes	Yes	Yes					
Energy Solutions Duratek	East	Donnie Brackett	TN	865-220-1526	dbrackett@energysolutions.com	No	Yes	Yes	Yes	No	Yes	Yes	Yes			Yes	Yes
		Danny Quayle	TN	865-425-4563	dnquayle@energysolutions.com		Yes		Yes	Yes		No	Yes	Yes	Yes		
Environ. Mgt. Ctrls. (EMC)	N.CA NV.CO	Richard Gallego	CA	714-997-8050	rgallego@tgainc.com	Yes	No	Some	Yes	Yes	Yes	TX<120d	Yes	No	No	Yes	Yes
NAC Philotechnics	All	Meghan Turvey	TN	865-385-3064	mgturvey@nacphilo.com	Yes	Yes	Yes		Yes	Yes	Yes	Yes	No	Some	Yes	Yes
	All	Mike Miller	TN, PA	724-480-7562	mmiller@nacphilo.com	Yes	Yes	Yes		Yes	Yes	Yes	Yes	No	Some	Yes	Yes
New Order Environmental Servic	ALL	Landen Collins	NM	585-738-8448	Landen@neworderenvironmental.com	No	No	Yes	Yes	Yes	Yes	No	No	No	Some	No	No
NORM Services	All	Robert Krumberger	CO	303-828-6635	rkrumberger@normservices.com	No	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	No
NSSI	All	Gamaliel Torres	TX	713-541-0391	info@nssienvironmenta.com	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Permafix Env. Services, Inc.	All	Jeff Bowers	TN	925-178-3155	jbowers@perma-fix.com	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plexus Scientific Corporation	All		MD	703-820-3339	info@plexsci.com	No	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	No
Qal-Tek Associates	All	Casey Smith	ID	208-523-5557	gogia@qaltek.com	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
QSA-Global, Inc.	All	Patrick O'Sullivan	GA	229-751-3853	patrick.osullivan@qsa-global.com	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Some	Yes	
Radiac Research	N-East	Art Green	NY	718-963-2233 x207	agreen@radiacenv.com	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No		Yes
Radiation Pros, LLC	all	Kurt Rhea	CO	720-771-0200	kurt.rhea@radpros.com	No	Some	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	No
Radiation Safety Assoc.	Atlantic	Paul Steinmeyer	CT	860-228-0487	kpstein@racpro.com	Yes	Yes	Yes	Yes	Some	Yes	No	Yes	Yes	Yes		
Radiation Solutions, LLC	All	Jon O'Rullian	ID	208-206-3203	jorullian@radiationsolutionsonline.com	Yes	Yes	No	No	Yes	Yes	No	Yes	No	Yes	No	
RAM Services	All	Jerry Wiza	WI	920-386-3899	jwiza@ramservicesinc.com	Yes	Yes	Some	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes
ReNuke Services, Inc.		Heather	TN	865-813-1960	heather@renuke.com												
R.M. Wester	Mid-West	Joe Koch	MO	636-328-9628	jkoch@rmwester.com	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes		
Rocky Mt. H.P. Consultants	Rocky Mts.	Edd Johnson	UT	801-380-3778	edsqared@aol.com	Yes	Yes	No	No	Yes	No	TX<120d	No	Yes	Yes	Yes	
RSO, Inc.	East	David Wellner	MD	301-953-2482 x306	dwellner@rsoinc.com	Yes	No			Yes	Yes	Yes	Yes	Yes	Yes	Yes	
		Greg Smith	MD	301-953-2482 x322	gdsmith@rsoinc.com	Yes	Yes	Yes									
Solutient Technologies	All	Steve Pocock	OH	330-497-5905	info@solutientech.com	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No	Some	No	No
Thomas Grey Assoc.	West	Richard Gallego	CA	714-997-8090	rich@tgainc.com	Yes	Some	Yes	Yes	Yes	Yes	TX<90d	No	No	Yes	Yes	Yes
US Ecology, Inc.	All	Sherry Frenette	ID	702-812-7925	sfrenette@republicservices.com	No	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	No
Veolia	All	Liza Kraas	NJ	973-691-7333	liza.kraas@veolia.com	No	No	Yes	Yes	Yes	No	No	No	No	Yes	No	No
Waste Control Specialists LLC	All	Thomas Hanna	TX	352-318-1138	thanna@wcs.exas.com	No	No	No	Some	Yes	Yes		Yes	No	No		Yes

1 All firms inspect materials, identify radionuclides, deal with leaking sources and associated contamination, provide packaging, contract for manufacturer's acceptance or waste processing and disposal as applicable, arrange transport and disposal permits, and report material transfer. Additional firms that specialize in NORM scale are on www.crcpd.org 'Directory of Commercial Services,' see 'Radioactive Site Investigation and Decontamination Services.'

2 A firm is listed here if it has staff and equipment to provide the services, described in footnote 1 and columns, to the general public in multiple states and has good reputation among radiation control authorities

3 Principal region served: North-East = north of Virginia, East = east of Mississippi River, Mid-west = from Rocky Mt. to Appalachians, West = west of great plains.