

ANNEX D

RADIOLOGICAL PROTECTION

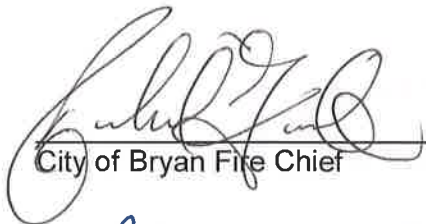
August 2021

**Brazos County
Inter-jurisdictional Emergency Management**

APPROVAL & IMPLEMENTATION

Annex D

Radiological Protection


City of Bryan Fire Chief

8/13/21
Date


City of College Station Fire Chief


8/2/21
Date


South Brazos County Fire Chief


8/2/2021
Date


Brazos County District 2 Fire Chief

8/19/21
Date


Brazos County Precinct 3 Fire Chief

8/2/21
Date


Brazos County Precinct 4 Fire Chief

8-5-21
Date


Texas A&M University EMC

8/19/21
Date

RECORD OF CHANGES

Annex D

Radiological Protection

Change #	Date of Change	Entered By	Date Entered

ANNEX D

RADIOLOGICAL PROTECTION

I. AUTHORITY

- A. Refer to Section I of the basic plan for general authorities.
- B. OSHA Regulation 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response*.
- C. Annex D, Radiological Emergency Management, to *the State of Texas Emergency Management Plan*.

II. PURPOSE

The purpose of this annex is to define organizational concepts and procedures, establish the local organization, and to assign responsibilities for an effective operational radiological protection program (RPP) for preparation and response in the event of a radiological emergency affecting this jurisdiction. This will allow our jurisdiction to provide a coordinated response to emergencies involving radioactive materials and for determination and implementation of local measures to protect life, property, and the environment during the course of the event.

III. EXPLANATION OF TERMS

AHJ	Authority Having Jurisdiction
DOE	(US) Department of Energy
DHS	Department of Homeland Security
DPS	Department of Public Safety
DSHS	Department of State Health Services
EOC	Emergency Operations Center
EMC	Emergency Management Coordinator
FEMA	Federal Emergency Management Agency
OSHA	Occupational Safety and Health Administration
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
NIMS	National Incident Management System
NRC	Nuclear Regulatory Commission
RCP	Radiation Control Program
RO	Radiological Officer
RSO	Radiological Safety Officer
RPP	Radiological Protection Program
SMRAP	The Southern Mutual Radiation Assistance Plan
SOP	Standard Operating Procedures
TDEM	Texas Division of Emergency Management
TLETS	Texas Law Enforcement Telecommunications System
TxDOT	Texas Department of Transportation

IV. SITUATION & ASSUMPTIONS

A. Situation

1. General.

- a. See the general situation statement and hazard summary in Section IV.A of the Basic Plan.
- b. Radioactive materials are hazardous materials that receive special coverage in state and federal laws and regulations covering such materials. However, radiological materials are also subject to a number of specific state and federal laws and regulations that control the handling and use of such materials and plans that establish unique state and federal procedures for handling incidents involving them. In addition, the state and federal agencies that provide advice and assistance to local governments during radiological incidents differ from those that provide advice and assistance during most other hazardous materials incidents
- c. Except for radiological incidents involving federal facilities or federally owned nuclear materials, the State or local government has the responsibility for taking required emergency response actions. Response from this jurisdiction will be in compliance with the National Incident Management System (NIMS) operating principles and protocols and will constitute general guidance for all responders to the radiological incident. Support may be requested from federal agencies pursuant to the National Response Plan (NRP). The Department of Homeland Security (DHS) has overall responsibility of all actual and potential Incident of National Significance and accidents or incidents involving nuclear or radioactive materials that may or may not rise to the level on an Incident of National Significance. Various federal coordinating agencies will lead the response to incidents of lesser severity by coordinating federal radiological monitoring assistance to state and local governments
- d. The Department of State Health Services, Radiation Control Program (DSHS/RCP), as the state radiation control agency, has primary responsibility for the state radiological protection program. DSHS/RCP also provides statewide training for RO/RSO and radiological monitors.
- e. The federal agency responsible for accidents at nuclear facilities licensed by the State of Texas or incidents involving shipments of radioactive materials licensed by the State is the Nuclear Regulatory Commission (NRC). The US Department of Energy (DOE) and Department of Defense (DOD) have the lead federal role in incidents at their facilities or accidents involving their shipments. Each of these federal agencies in addition to the United States Coast Guard (USCG), the Environmental Protection Agency (EPA), and the National Aeronautics and Space Administration (NASA) may serve as a coordinating agency for DHS.
- f. Additional external resources may be available and requested by the State of Texas in accordance with the Southern Mutual Radiation Assistance Plan (SMRAP).

2. Radiological Hazards.

- a. This jurisdiction is susceptible to accidents involving radioactive materials at fixed sites and/or in transport. Texas A&M University, hospitals and other medical facilities use a wide range of radioactive sources in nuclear medicine, as well as, in research and development programs. Radioactive sources are used to x-ray pipe welds, in well logging, and for many other common industrial and business uses. These sources can be extremely hazardous (life threatening) when removed from their containers, either intentionally or by accident. A variety of radioactive materials are transported on our highways and rail systems, sometimes in unmarked vehicles. Additionally, radioactive materials may be present on some aircraft.

B. Assumptions

1. Brazos County may experience radiological emergency situations, which may threaten public health and safety, private or public property and/or the environment, which will necessitate the implementation of protective actions for the public at risk.
2. A nuclear attack against the United States is considered highly unlikely. The deliberate release of radioactive materials by criminals or terrorists in the local area is possible but considered unlikely.
3. Proper development and execution of an RPP can significantly reduce the number of casualties that could result from a radiological accident. A combination of trained local radiological personnel, operational detection equipment, and containment/decontamination equipment and facilities should be available to detect, assess the threat posed by, and contain radiological accidents.
4. We must be prepared to carry out the initial emergency response on an independent basis. If our resources alone are inadequate to cope with a radiological incident, we may request state assistance through our Disaster District. The DSHS/RCP, as the state radiation control agency, will provide advice and assistance to local personnel in responding to an incident involving an actual or suspected radiological release.
5. Local emergency operations, including the use of mutual aid resources, will be directed by local officials, except in those situations where state or federal law requires that a state or federal agency exercise lead responsibility or where local responders lack the necessary expertise and/or equipment to cope with the incident and agree to permit those with the expertise to take charge.
6. The State may request supplemental emergency assistance from other states or from the federal government when local and state resources are insufficient to deal with the emergency.

V. CONCEPT OF OPERATIONS

A. General

1. A basic local radiation protection program (RPP) consists of the Emergency Operations Center (EOC) and an incident response capability that includes one or more RO/RSOs to manage the program and trained radiological monitors equipped with appropriate radiation detection and communication equipment. Each hazmat team has members that are trained on radiological incident response. These members may serve as the lead within their jurisdiction and are referred to as the RO for the purposes of this plan. Texas A&M University is the only jurisdiction that has a RSO as defined by the DSHS/RCP. The TAMU RSO may serve as a subject matter expert prior to and/or during a response upon request of the incident commander.
2. To conduct an effective RPP, we will:
 - a. Maintain information on radiological monitoring instruments by type, number, location, and owner. We own and maintain some specialized radiological detection equipment and we possess radiation detection equipment on loan from the State. See Appendix 1 for a list of radiological monitoring resources within our jurisdiction.
 - b. Establish procedures for initial emergency response to radiological accidents. See the Radiological Incident Response Checklist in Appendix 2.
 - c. Establish a radiological incident reporting system. See Appendix 3.
 - d. Appoint personnel and provide training to local emergency responders, emergency management personnel, RO/RSOs, and radiological monitors. See Appendix 4.
 - e. Establish procedures for decontamination and recovery operations.

B. Radiological Accidents

1. Discovery. Radiological accidents may be discovered by the public, by businesses that use or transport such materials, or by local responders who are summoned to an accident site. Local personnel are likely to be first emergency responders on the scene of a radiological accident. The first local emergency responder at the scene will take charge, initiating the incident command system (ICS), and serve as the Incident Commander until relieved by a more senior or more qualified individual.
2. Local Notification. The Incident Commander will provide information on the incident to local officials through the Communications Center using the Hazardous Materials Incident Report provided in Tab A to Appendix 3. The Incident Commander shall make an initial assessment of the situation, to include an estimate of the likelihood of a release of radiological materials. If it appears that radiological materials have been released into the environment or such a release appears likely, the EOC will be activated to support the incident response.
3. Response Actions. The Incident Commander should identify response resources required and direct the on-scene response to contain or prevent spread of

contamination at the incident site. The initial response should be accomplished in accordance with established hazardous materials response criteria and the general checklist in Appendix 2. At least one trained RO/RSO or radiological monitor should participate in the response to a known or suspected radiological incident.

4. Protective Actions.

a. Short Term.

- 1) If it appears that a release of radiological materials has occurred or is possible, the Incident Commander is responsible for determining and implementing appropriate protective actions for the public in the immediate area of the incident. The Incident Commander is also responsible for advising personnel responding to the incident of potential hazards and determining requirements for personal protective equipment (PPE). Responders who lack appropriate hazardous materials training and appropriate PPE should not be committed to radiological incidents.
- 2) If it appears that a radiological release has or may affect areas beyond the incident site, the incident commander should coordinate with the EOC to agree upon a division of responsibilities for warning the public, making required notifications, implementing protective actions for the public in areas beyond the incident site, and obtaining additional resources and technical assistance.
- 3) Suitable initial public protective actions for a radiological incident may include evacuation and/or sheltering in place. Appendix 4 to Annex Q, Hazardous Materials & Oil Spill Response provides additional information on selecting public protective measures.

- b. Long-term Protective Measures. DSHS/RCP will normally conduct a detailed incident assessment, identify affected areas through radiological monitoring, recommend follow-on protective measures to protect public health, and oversee recovery operations. Long-term protective measures may be implemented by DSHS or other state regulatory agencies and may include controls on the movement and use of livestock, foodstuffs, milk, and feed from contaminated areas and on the use of drinking or irrigation water from contaminated sources.

5. State and Federal Notifications. The Communications Center or the EOC, if activated, shall be responsible for making required emergency notifications to state and federal agencies. Radiological releases should be reported to:

- a. The local Department of Public Safety (DPS) office in Bryan which will relay information to the Disaster District Committee (DDC) and the Texas Division of Emergency Management.
- b. The DSHS/RCP at: 1-512-458-7460 (24-hour).
- c. The State Environmental Hotline at 1-800-832-8224.
- d. The National Response Center at 1-800-424-8802.
- e. If incident involves a deliberate release of radiological materials, the FBI office in Bryan at 979-731-0600.

See Appendix 3, Texas Radiological Incident Reporting System, and Tab A to Appendix 3, Hazardous Materials Incident Report, for additional information.

6. **State & Federal Assistance.** The EOC is responsible for coordinating with the DSHS/RCP to obtain technical advice and assistance regarding radiological issues. The DSHS/RCP staff in Austin has the capability to provide advice by telephone to the EOC or directly to the Incident Commander until DSHS/RCP personnel arrive on the scene. The DSHS/RCP may formulate requests for the Governor for additional radiological monitoring and assessment assistance from the federal government or from other states, if required. The County Judge and/or Mayor may request other types of state assistance through the Disaster District Committee Chairperson.
7. **Situation Updates.** The Incident Commander shall provide situation updates to the EOC; the EOC should prepare and transmit situation reports to the Disaster District. See Annex N for guidance on situation reporting.
8. **Monitoring of Emergency Workers.** Exposure records and medical follow-up will be provided for responders who have entered contaminated areas.
9. **US Government Nuclear Materials.** In the event of a radiological accident involving nuclear weapons, special nuclear material (SNM), or classified components, the federal agency, which owns that material may declare a National Defense Area (NDA) or National Security Area (NSA) around the site and take exclusive control within that area. NDAs and NSAs are established to safeguard classified information or restricted data, equipment, or material.
10. **U.S. Department of Energy (DOE) Shipments.** U.S. DOE has jurisdiction on accidents involving DOE transuranic waste shipments. Information on these shipments and guidance on dealing with incidents involving such shipments is provided in Appendix 5.

C. Deliberate Acts

The deliberate release of radioactive materials is a crime under a number of state and federal laws. Any incident of this type must be promptly reported to local and state law enforcement agencies. The Federal Bureau of Investigation (FBI) has lead responsibility for criminal investigations of terrorist acts or terrorist threats involving weapons of mass destruction (WMD), including improvised radiological dispersion devices; the Department of Public Safety (DPS) is the lead state agency. The DHS is responsible for overall coordination of all actual and potential Incidents of National Significance and accidents or incidents involving radiological materials that may or may not rise to the level of an Incident of National Significance; Texas Division of Emergency Management (TDEM) is the lead state agency. If a release of radiation is believed to be an act of terrorism, we will ensure the incident is reported to both to the Texas Department of Public Safety (DPS) and the FBI. More information on dealing with terrorist events is provided in Annex V, Terrorist Incident Response.

D. Activities by Phases of Emergency Management

1. Prevention

- a. Maintain an effective public warning system.
- b. Establish/maintain a hazardous cargo route.

2. Preparedness

- a. Establish an RPP system.
- b. Select and train RPP personnel.
- c. Ensure responders have data available on local facilities that are licensed to use, store, or transport radiological materials. This information may be obtained from the DSHS/RCP.
- d. Ensure radiation detection instruments are available and operational.
- e. Educate the public about radiological hazards and protective actions.

3. Response

- a. Activate the RPP system.
- b. Respond in accordance with the guidelines in Appendix 2.
- c. Provide information and instructions to the public.

4. Recovery

- a. Ensure radiation source material is removed and ensure access to contaminated areas is controlled until they are cleaned up. Cleanup will normally be performed by a contractor supervised by state or federal agencies and paid for by the responsible party, if one can be located.
- b. Work with state and federal agencies to assess damage, if any.
- c. Work with the DSHS/RCP to continue area radiation monitoring, if required.
- d. Work with the DSHS/RCP to determine the cause of the incident and determine liability.
- e. Keep the public informed about the status of the incident.

VI. ORGANIZATION & ASSIGNMENT OF RESPONSIBILITIES

A. Organization

1. The RO/RSO is in charge of the RPP on a day-to-day basis. Once a radiological accident occurs, responsibility for managing and directing the response is assigned to the Incident Commander and responsibility for coordinating external support is assigned to the EOC staff.
2. Effective response to a radiological incident requires a coordinated response by local departments, agencies, and officials, together with representatives of the facility or company responsible for the incident, augmented, in certain circumstances, by state and federal agencies with responsibilities for radiological incidents. Technical assistance for a radiological incident may be provided by the facility, by state and federal agencies, or by industry. See paragraph V.B.6, this annex for more information on state and federal assistance.

B. Assignment of Responsibilities

1. The Fire Chiefs will designate one or more RO/RSO to coordinate all radiological protection program activities.
2. The Incident Commander (IC) will:
 - a. Manage emergency response resources and operations at the incident site to control the incident.
 - b. Determine and implement protective actions for emergency responders and the public in the vicinity of the incident site.
3. Fire Service(s) will:
 - a. Provide personnel and equipment to contain or control radiological incidents.
 - b. Carry out initial radiological monitoring needed to assess the situation and determine protective actions. State or federal agencies may provide follow-on radiological monitoring assistance.
 - c. Carry out initial decontamination where needed. Large-scale decontamination, if needed, may be coordinated by state or federal agencies.
 - d. Assist in evacuation, if necessary.
4. The RO/RSO will:
 - a. In the first quarter of each year, obtain a current listing of local licensed users of radiological materials from DSHS/RCP, maintain a copy of that list, and provide copies to emergency response elements for use in operational planning.

- b. Ensure a sufficient number of radiological detection instruments are in-place and operational.
 - c. Ensure selected emergency responders are provided training in radiological monitoring.
 - d. Schedule and conduct an annual review of this annex and coordinate update of the annex, if needed.
5. Law Enforcement will:
- a. Restrict access to incident sites and contaminated areas to protect public health and safety.
 - b. Organize and conduct evacuations and provide traffic control as needed, if necessary.
 - c. Assist in warning the public, as necessary.
 - d. If the release of radiation appears deliberate, control the scene, apprehend suspects, conduct an investigation, and if, the incident appears to be terrorism-related, ensure DPS and the FBI are advised.
6. EMS will:
- a. Provide medical care and transportation for casualties.
 - b. Alert hospitals of the potential for contaminated victims.
7. Hospital(s) will:
- a. Provide medical care for casualties as needed.
 - b. Be prepared to decontaminate contaminated patients.
8. County Road and Bridge and/or City Public Works will:
- a. Provide personnel, equipment, and supplies requested to support emergency operations.
 - b. Provide technical assistance to the Incident Commander and the EOC upon request.
 - c. In accordance with established procedures, provide personnel to staff the Incident Command Post (ICP) or EOC when activated.

VII. DIRECTION & CONTROL

- A. Guidance.** The County Judge and/or Mayor(s) will establish local policies relating to radiological protection and may provide general guidance for emergency operations.
- B. Program Management.** The RO/RSO will carry out day-to-day management of the RPP.
- C. Operational Direction.** During radiological incidents, the IC will manage radiological response operations at the incident site. The IC and the EOC shall agree upon a division of responsibilities for specific tasks. Typically, the EOC will conduct support operations, including activating additional resources and requesting external resources, making required notifications and reports, coordinating large scale evacuations and area traffic control, disseminating emergency public information, and other tasks to sustain emergency operations.
- D. Communications.** Telephone, radio, teletype, e-mail, and/or facsimile will be used to transmit reports of radiological incidents, obtain technical assistance, exchange information, and provide direction and control.

VIII. READINESS LEVELS

Radiological incidents typically occur without warning. Hence, developing a systematic set of increased readiness actions is difficult.

A. Level IV - Normal Conditions.

See the prevention and preparedness activities in Section V.D, Emergency Management Activities by Phase.

- B. Level III - Increased Readiness.** Increased Readiness may be appropriate if there is a greater than normal threat of a radiological incident. Initiating conditions may include a radioactive source missing in our region, notification that a significant radioactive shipment will be transiting our area, or a significant change in the Homeland Security Threat Level due to a radiological threat. Level 3 readiness actions may include:

1. Monitoring the situation.
2. Informing first responders of the situation.
3. Ensuring the hazardous materials response team is aware of the situation and can respond if necessary.

- C. Level II - High Readiness.** High Readiness may be appropriate if there is an increased risk of a radiological incident. Initiating conditions may include a significant radiological shipment is transiting through our area, a radioactive source is missing in our jurisdiction, or notification of a significant change in the Homeland Security Threat Level due to a specific radiological threat. Level 2 readiness actions may include:

1. Monitoring the situation.

2. Alerting personnel for possible emergency duty and deploying personnel and equipment to investigate incidents.
3. Checking equipment and increasing short-term readiness if possible.
4. Issuing public warning and providing public information if necessary.

D. Level I - Maximum Readiness. Maximum readiness is appropriate when there is a significant possibility of a radiological release. Initiating conditions might include a lost radioactive source being located in the local area, activation of radiological alarms at a landfill screening point, an incident at a facility licensed to use radiological materials, or notification of a significant change in the Homeland Security Threat Level due to a specific radiological threat addressing this jurisdiction or facilities possessing radioactive materials. Level 1 readiness actions may include:

1. Investigating the situation and partially or fully activating the EOC to monitor it.
2. Placing first responders in alert status; placing off-duty personnel on standby.
3. Advising appropriate state and federal agencies.
4. Preparing to issue and issuing public warning if it becomes necessary.

IX. ADMINISTRATION & SUPPORT

A. Agreements & Contracts

Should our local resources prove to be inadequate during an emergency; requests will be made for assistance from mutual aid agreements, state and/or federal agencies, and industry in accordance with existing mutual-aid agreements and contracts.

B. Reports & Records

1. **Situation Reports.** If there has been an actual release of radioactive materials, the EOC should prepare and disseminate a periodic situation report to state and federal agencies, through the DDC, until the situation is resolved. It may be desirable to also disseminate this report to nearby jurisdictions and to those cities or counties that are providing mutual aid resources. See Annex N, Direction and Control, for the format of and instructions for this report.
2. **Activity Logs.** The ICP and the EOC shall maintain accurate logs recording key response activities; activities to be logged are outlined in Section IX of our Basic Plan.
3. **Response & Recovery Expenses.** As it may be possible to recover some expenses incurred in responding to a release of radiological materials from the responsible party, insurers, or the federal government, each department or agency shall

maintain detailed records of labor costs, equipment usage, and supplies expended to respond to or recover from an actual radiological release.

4. **Post-Incident Review.** A post-incident critique shall be conducted in the aftermath of any incident that resulted in an actual release of radiological materials.

C. Maintenance of Radiological Equipment

1. All radiological monitoring devices owned by County and/or Cities will be maintained in accordance with the manual of instructions for those instruments.
2. State-owned instrument sets obtained from DSH/RCP are normally exchanged periodically by the DSHS/RCP so they can be serviced and calibrated. The RO/RSO will coordinate instrument exchanges, calibrations, and any out-of-cycle maintenance requirements for state-owned instruments with DSHS/RCP.

D. Training

Federal law requires that individuals, who respond to hazardous materials incidents, including radiological incidents, should be adequately trained and equipped for the tasks they will perform. Training is available through a combination of federal, state, and local sources; see Appendix 4.

X. PLAN DEVELOPMENT & MAINTENANCE

A. Development. The Fire Chief, with assistance from the EMC, is responsible for developing and maintaining this annex.

B. Maintenance. This annex will be reviewed annually and updated in accordance with the schedule outlined in Section X of the basic plan.

XI. REFERENCES

U.S. Department of Transportation and Transport, *Emergency Response Guidebook*.

FEMA, *Guide for All-Hazard Emergency Operations Planning*, SLG-101.

FEMA, *Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents*, FEMA-REP-5.

APPENDICES:

Appendix 1	Radiological Instrument Inventory
Appendix 2	Radiological Incident Response Checklist
Appendix 3	Texas Radiological Incident Reporting System
Tab A.....	Hazardous Materials Incident Report
Appendix 4	Radiological Response Training & Instruments
Appendix 5	Shipments of Transuranic Waste

RADIOLOGICAL INSTRUMENT INVENTORY
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Type of Instrument	# in Stock	Location	Owner (Local/State)
Fluke Biomedical ASM 993	2	Brazos County Health District	Brazos
Berkeley Nucleonics SAM 945-GN	1	Brazos County Health District	Brazos
Ludlum 14C	2	Bryan Fire Department	Bryan
Bendix Dosimeter CD V-742	3	Bryan Fire Department	Bryan
Bendix Dosimeter Charger	1	Bryan Fire Department	Bryan
Victoreen CDV-715 (model 1A)	1	Bryan Fire Department	Bryan
Lionel CDV-700 (model 6B)	1	Bryan Fire Department	Bryan
Area Rae	2 with Gamma	College Station Fire Department	College Station
Ludlum 2241-3	1	College Station Fire Department	College Station
Ludlum 44-9 (Pancake Probe)	1	College Station Fire Department	College Station
Ludlum 44-2- Low Dose Gamma Scintillator	1	College Station Fire Department	College Station
Ludlum 133-6- High Dose Gamma Scintillator	1	College Station Fire Department	College Station
Canberra- Ultra Radiac	4	College Station Fire Department	College Station
Radiation Alert-Monitor 4	2	College Station Fire Department	College Station
Eberline- RO-2	2	College Station Fire Department	College Station
Dosimeter- CDV-742	6	College Station Fire Department	College Station
Dosimeter- Arrow Tech 138	9	College Station Fire Department	College Station
Ludlum 14C- GM	7	Nuclear Science Center	TAMU
Tracerco T201- Ion Chamber	2	Nuclear Science Center	TAMU
Tracerco T202-A-4-GM	2	Nuclear Science Center	TAMU
Victoreen 451P-Ion Chamber	4	Nuclear Science Center	TAMU

Ludlum 9DP- Ion Chamber	1	Nuclear Science Center	TAMU
Ludlum ICS-4000- Identifier	1	Nuclear Science Center	TAMU
Ludlum 2200- Swipe Meter	3	Nuclear Science Center	TAMU
Ludlum 177- Rem Ball (Neutron Detector)	1	Nuclear Science Center	TAMU
Tennelac- Swipe Counter	1	Nuclear Science Center	TAMU
HPGe Detector- Isotope Identifier	2	Nuclear Science Center	TAMU
PIC's- 0-200 mR Range- Dosimeter	150	Nuclear Science Center	TAMU
PIC's 0-5 R Range- Dosimeter	50	Nuclear Science Center	TAMU
Ludlum model 53- Contamination Monitor	2	Nuclear Science Center	TAMU
Canberra- Gas Flow hood foot monitor	1	Nuclear Science Center	TAMU
Bicron Micro rem- Ion Chamber	2	Nuclear Science Center	TAMU
Victoreen 451P-Ion Chamber	1	1111 Research Parkway	TAMU- EHS
Victoreen 450P- Ion Chamber	1	1111 Research Parkway	TAMU-EHS
Ludlum 4901P- Hand Foot Monitor	1	1111 Research Parkway	TAMU- EHS
Ludlum 3- End Window GM	1	1111 Research Parkway	TAMU- EHS
Ludlum 1- End Window GM	1	1111 Research Parkway	TAMU-EHS
Ludlum 12- Nal Probe	1	1111 Research Parkway	TAMU-EHS
Ludlum 3- Nal Probe	1	1111 Research Parkway	TAMU-EHS
Ludlum 3- GM Pancake Probe	3	1111 Research Parkway	TAMU-EHS
PerkinElmer TriCarb 4910- Liquid Scintillation Counter	1	1111 Research Parkway	TAMU-EHS
Bicron Micro rem- Ion Chamber	1	TAMU Cyclotron	TAMU- EHS
Victoreen 451P- Ion Chamber	1	TAMU Cyclotron	TAMU-EHS
Ludlum 12-Nal Probe	1	TAMU Cyclotron	TAMU-EHS
Ludlum 2- End Window GM	1	TAMU Cyclotron	TAMU-EHS
Ludlum 3- GM Pancake Probe	1	TAMU Cyclotron	TAMU EHS

Perkin Elmer TriCarb 3110TR- Liquid scintillation counter	1	TAMU Cyclotron	TAMU-EHS
Health physics instruments Rem 500- Neutron Detector	1	TAMU Cyclotron	TAMU-EHS

RADIOLOGICAL INCIDENT RESPONSE CHECKLIST

□	Action Item	Assigned
	1. If the situation requires it, isolate the site and deny access. <ul style="list-style-type: none"> • Use emergency vehicles, barricades, barrier tape, etc. 	
	2. Classify incident, provide basic situation information to dispatch, and identify response resources required. See Incident Classification page 3, this appendix. <ul style="list-style-type: none"> • Level I – Incident • Level II – Emergency • Level III – Disaster 	
	3. Record situation on a Hazardous Materials Incident Report (see Appendix 3, Tab A) and provide to Communications Center.	
	4. Communications Center should relay situation information to emergency responders, who should dispatch forces in accordance with their SOPs. If separate fire and law enforcement Communications Centers are used, the center receiving the initial report should pass it to the other dispatch center.	
	5. Determine extent of danger to responders and establish requirements for personal protective equipment (PPE) and specialized response equipment. See Response Personnel Safety in Annex Q, Appendix 4.	
	6. Ascertain extent of danger to general public; determine specific areas and special facilities (schools, hospitals, nursing homes, prisons, and other institutions), if any, at risk.	
	7. Develop initial action plan to contain and control the release of radiological material.	
	8. Determine appropriate protective actions for the public and special facilities. See Annex Q, Appendix 4. If evacuation is contemplated, see the General Evacuation Checklist in Annex E, Evacuation.	
	9. Initiate warning and issue protective action recommendations for the general public. See Annex A, Warning, and Annex I, Emergency Public Information.	
	10. Warn special facilities, provide protective action recommendations and instructions, and determine requirements for assistance. Provide assistance requested.	
	11. If evacuation will be conducted, provide traffic control and be prepared to provide transportation to those who lack it.	
	12. If evacuation will be conducted, provide traffic control and be prepared to provide transportation to those who lack it.	
	13. Warn other communities that may be threatened by the radiological release.	
	14. If possibility exists of casualties that are contaminated with radiological material, ensure EMS units and hospitals are so advised.	
	15. If evacuation is recommended, staff and open temporary shelters for evacuees. See Annex C, Shelter and Mass Care.	

□	Action Item	Assigned
	<p>16. Notifications: See Tab A to Appendix 3 for notification procedures and telephone numbers. The TDSHS/RCP must be contacted for radiological accidents. They can provide assistance as needed. See paragraph V.B.6, this annex.</p> <ul style="list-style-type: none"> • Advise the responsible party to report release to state and federal authorities as required by state and federal statutes and regulations. • If the County and/or City is responsible for the release, it must make required notifications to state and federal agencies. • If the responsible part cannot be identified/located, County and/or City should make required notifications, making it clear that the responsible party is presently unknown. 	
	17. If water or wastewater systems are threatened by radioactive contamination, advise system operators so they may implement preventative measures.	
	18. If on-scene technical assistance is required, request assistance from industry or appropriate state or federal agencies.	
	<p>19. If additional response resources are required, request them.</p> <ul style="list-style-type: none"> • Invoke mutual aid agreements. • Summon HAZMAT response contractor, if one is under contract. • Request assistance from the State through the Disaster District. 	
	20. Provide updated information on the incident to the public through media releases.	
	21. Continuously document actions taken, resources committed, and expenses incurred.	
	21. Retain message files, logs, and incident-related documents for use in incident investigation and legal proceedings and to support claims for possible reimbursement from the responsible party or state and federal agencies.	
	22. Assess contamination and determine which areas are safe to re-enter. Determine and implement remediation measures for other areas.	
	23. As evacuated areas are determined to be safe to reenter, advise evacuees and special facilities they may return, providing traffic control as needed.	
	24. Curtail shelter and mass care operations as evacuees depart.	
	25. If some areas will require long-term cleanup before they are habitable, develop and implement procedures to mark and control access to such areas. NOTE: Clean up is the responsibility of the responsible party.	
	26. If some areas will require long-term cleanup before they are habitable, develop and implement procedures to mark and control access to such areas. NOTE: Clean up is the responsibility of the responsible party.	
	27. Assist evacuees who cannot return to their homes in finding temporary housing and obtaining social services.	
	28. Conduct post-incident review of response operations.	

Incident Classification.

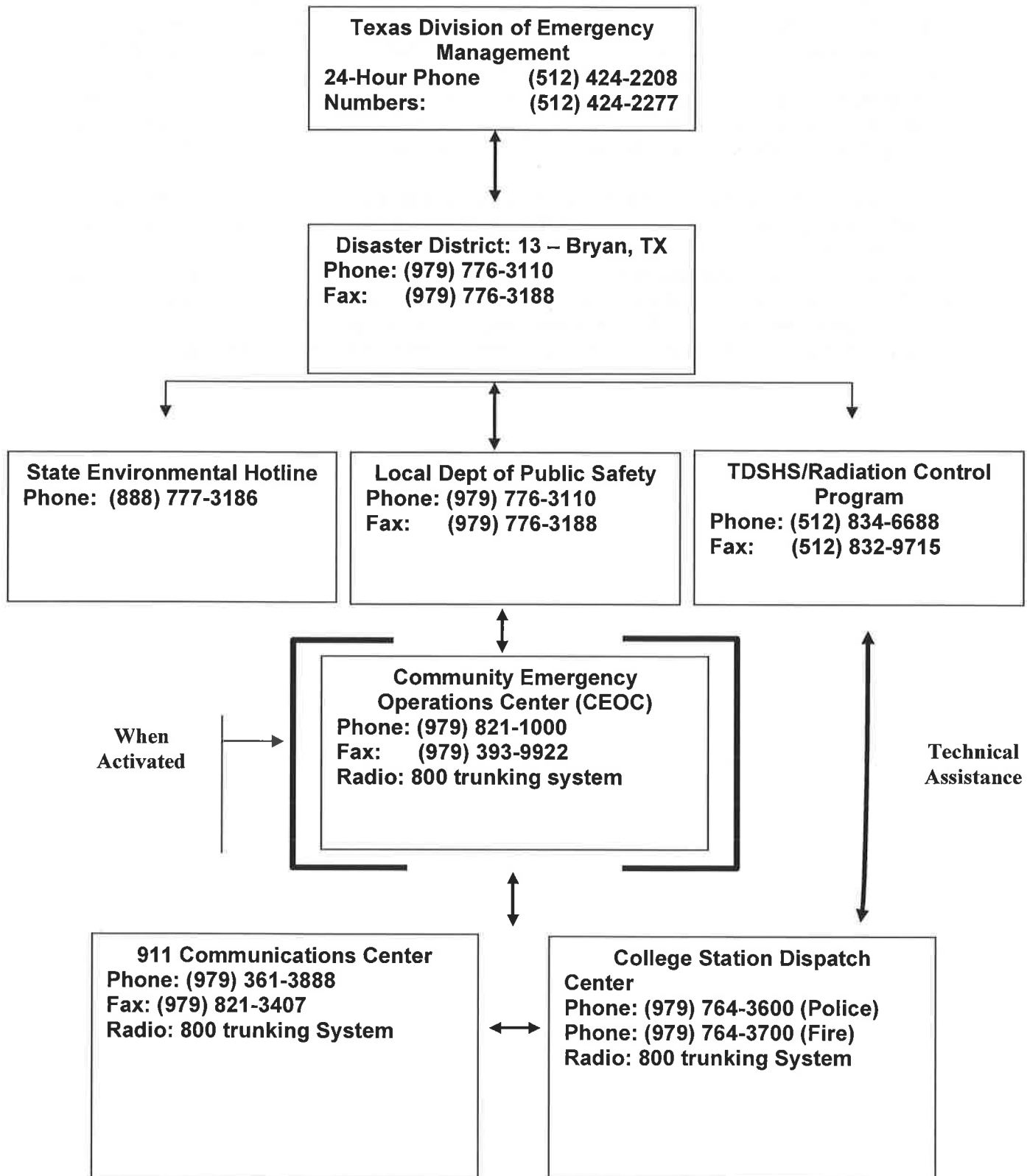
Level 4/5– Incident. An incident is a situation that is limited in scope and potential effects; involves a limited area and/or limited population; evacuation or sheltering in place is typically limited to the immediate area of the incident; and warning and public instructions are conducted in the immediate area, not community-wide. This situation can normally be handled by one or

two local response agencies or departments acting under an Incident Commander (IC), and may require limited external assistance from other local response agencies or contractors.

Level III – Emergency. An emergency is a situation that is larger in scope and more severe in terms of actual or potential effects than an incident. It does or could involve a large area, significant population, or critical facilities; require implementation of large-scale evacuation or sheltering in place and implementation of temporary shelter and mass care operations; and require community-wide warning and public instructions. You may require a sizable multi-agency response operating under an IC; and some external assistance from other local response agencies, contractors, and limited assistance from state and federal agencies.

Level I – Disaster. A disaster involves the occurrence or threat of significant casualties and/or widespread property damage that is beyond the capability of the local government to handle with its organic resources. It involves a large area, a sizable population, and/or critical resources; may require implementation of large-scale evacuation or sheltering in place and implementation of temporary shelter and mass care operations and requires a community-wide warning and public instructions. This situation requires significant external assistance from other local response agencies, contractors, and extensive state or federal assistance.

TEXAS RADIOLOGICAL INCIDENT REPORTING SYSTEM



HAZARDOUS MATERIALS INCIDENT REPORT

INITIAL CONTACT INFORMATION

Check one: ☐ This is an **ACTUAL EMERGENCY** ☐ This is a **DRILL/EXERCISE**

1. Date/Time of Notification: _____ Report received by: _____
2. Reported by (name & phone number or radio call sign): _____
3. Company/agency and position (if applicable): _____
4. Incident address/descriptive location: _____

5. Agencies at the scene: _____
6. Known damage/casualties (do not provide names over unsecured communications): _____

CHEMICAL INFORMATION

7. Nature of emergency: (check all that apply)
☐ Leak ☐ Explosion ☐ Spill ☐ Fire ☐ Derailment ☐ Other
 Description: _____

8. Name of material(s) released/placard number(s): _____
9. Release of materials:
 _____ has ended _____ is continuing Estimated release rate & duration: _____
10. Estimated amount of material, which has been released: _____
11. Estimated amount of material, which may be released: _____
12. Media into which the release occurred: _____ air _____ ground _____ water
13. Plume characteristics:
 a. Direction (Compass direction of plume): _____ c. Color: _____
 b. Height of plume: _____ d. Odor: _____
14. Characteristics of material (color, smell, liquid, gaseous, solid, etc) _____
15. Present status of material (solid, liquid, gas): _____
16. Apparently responsible party or parties: _____

ENVIRONMENTAL CONDITIONS

17. Current weather conditions at incident site:
 Wind From: _____ Wind Speed (mph): _____ Temperature (F): _____
 Humidity (%): _____ Precipitation: _____ Visibility: _____
18. Forecast: _____
19. Terrain conditions: _____

HAZARD INFORMATION
(From ERG Guidebook, MSDS, CHEMTREC, or facility)

20. Potential hazards: _____
21. Potential health effects: _____
22. Safety recommendations: _____
- Recommended evacuation distance: _____

IMPACT DATA

23. Estimated areas/ populations at risk: _____
24. Special facilities at risk: _____
25. Other facilities with Hazmat in area of incident: _____

PROTECTIVE ACTION DECISIONS

26. Tools used for formulating protective actions
- _____ a. Recommendations by facility operator/responsible party
 - _____ b. *Emergency Response Guidebook*
 - _____ c. Material Safety Data Sheet
 - _____ d. Recommendations by CHEMTREC
 - _____ e. Results of incident modeling (CAMEO or similar software)
 - _____ f. Other: _____
27. Protective action recommendations:
- _____ Evacuation _____ Shelter-In-Place _____ Combination _____ No Action
- _____ Other _____
- Time _____ Actions Implemented _____
- _____
- _____
- _____

28. Evacuation Routes Recommended: _____
- _____

EXTERNAL NOTIFICATIONS

29. Notification made to:
- | | |
|--|----------------------|
| _____ National Response Center (Federal Spill Reporting) | _____ 1-800-424-8802 |
| _____ Texas Environmental Hotline (State Spill Reporting) | _____ 1-800-832-8224 |
| _____ CHEMTREC (Hazardous Materials Information) | _____ 1-800-424-9300 |
| _____ TCEQ (Most Hazmat spills, except as indicated below) | _____ 1-800-832-8224 |
| _____ RRC (Oil/gas spills - production facilities, intrastate pipelines) | _____ 1-844-773-0305 |
| _____ TDSHS/RCP (Radiological incidents) (24 Hours) | _____ 1-512-458-7460 |
| _____ GLO (Petroleum spills in coastal waters or tributaries) | _____ 1-800-832-8224 |
| _____ Disaster District (TXDPS) in Bryan, TX | _____ 979-776-3102 |
| _____ TDEM State Operations Center (SOC) Austin (24 Hrs) | _____ 1-512-424-2208 |

30. Other Information: _____

RADIOLOGICAL RESPONSE TRAINING & INSTRUMENTS

1. The County and/or City Radiological Officer (RO) is responsible for coordinating the procedures in this appendix.
2. The purpose of this appendix is to provide guidelines and procedures for maintaining an adequate number of personnel trained to deal with radiological accidents and to maintain radiation detection instruments in operational condition.

a. Personnel training.

- 1) The County and each City will have several individuals trained as radiological officers.
- 2) DSHS Community Preparedness Section provides training for Radiological Officers and radiological monitors. Courses available include:
 - a) Fundamentals Course for Radiological Monitors – 8 hours
 - b) Advanced Course for Radiological Monitors – 32 hours

Additional training is also available from the Federal Emergency Management Agency (FEMA) in the form of independent study or residential training.

- 3) Personnel trained in radiological protection and decontamination techniques should receive the FEMA-approved refresher training at least every three (3) years
- 4) The Fire Department(s) and Hazmat Response Team(s) shall have at least one individual trained in radiological response and on the use of radiation detection instruments on each shift.

b. Radiation detection instruments

- 1) Inspections, maintenance, and repair of radiation detection instruments will be completed according to the owner's manual for those devices owned by the County and/or Cities.
- 2) Instruments on loan from the State will be inspected, maintained, and repaired according to instructions from the DSHS Community Preparedness Section.
- 3) Instruments sets used to respond to a possible radioactive material accident should be located in vehicles or 24-hour dispatch offices, such as fire stations, law enforcement, or emergency medical service facilities.
- 4) All other radiation detection/measuring instruments, not maintained in 24-hour facilities, should be secured in a dry (low humidity) location.

SHIPMENTS OF TRANSURANIC WASTE

1. Situation

- a. Brazos County is not on the planned route of shipments of transuranic (TRU) waste from US Department of Energy (DOE) facilities in the Southeast and Midwest to the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. Shipments will enter Texas westbound on I-20 from Louisiana, continue west on I-20 to Pecos, Texas, and then proceed north on US 285 into New Mexico.
- b. DOE TRU waste shipments through Texas commenced during 2001. An estimated 3,600 shipments are scheduled to pass through the State over a 20-year period.

2. Assumptions

- a. Brazos County should not experience a transportation accident involving TRU waste shipments.
- b. In the event of an incident involving a TRU waste shipment, the basic radiological response, notification, and recovery procedures outlined in Annex D will be implemented.
- c. In the event of an incident, external assistance will be available from state and federal radiological response resources.

3. Background**a. TRU Waste**

- 1) TRU waste is waste that is contaminated with man-made radioactive materials having atomic numbers greater than uranium (Z#92). These are alpha-emitting radionuclides with half-lives greater than 20 years in concentrations greater than 100 nanocuries per gram (nCi/g) of waste. A nanocurie is one billionth of a curie.
- 2) TRU waste include such materials as laboratory clothing, rubber gloves, rags, tools, glove boxes, glassware, piping, air filters, plastics, wood, metals, and solidified wastewater sludges contaminated with transuranic isotopes during nuclear weapons manufacturing, plutonium recovery, research and development, and decontamination and decommissioning activities. In addition, some of these wastes contain hazardous chemical constituents and are properly identified as "mixed" transuranic waste.
- 3) External exposure to TRU isotopes is generally not harmful, as human skin shields against alpha particles. The primary hazard is inhalation of fine particulates that might be release as a result of an extremely severe transportation accident. Ingestion is also a potential hazard, but most TRU isotopes are relatively insoluble and are generally passed through the body's digestive system rather than absorbed. An additional hazard is absorption if TRU isotopes were to enter the blood stream through an open wound. Also important to note is that many non-transuranic isotopes are present in TRU waste which may add a significant amount of beta and gamma radiation to the

TRU waste, making widely-available gamma detection instruments useful in determining if TRU waste has been released into the environment during an accident.

- 4) TRU waste is further classified as Contact Handled (CH) TRU or Remote Handled (RH). CH TRU-waste can be safely handled with no additional shielding other than that provided by the container, normally a 55-gallon drum or a steel box. Over 97 percent of TRU waste is classified CH. CH waste has radiation dose rates at the package surface of 200 millirem per hour or less. RH TRU waste requires additional heavy shielding for handling and transportation activities. Remote-handled (RH) TRU waste contains activation materials and fission products that decay by beta emission and penetrating gamma radiation; such waste has radiation dose rates at the package surface exceeding 200 millirem per hour.

4. Information for Emergency Planning.

- a. Transport Vehicles. A dedicated fleet of trucks operated by DOE contractors will transport TRU waste shipments to the WIPP. The trucks will pull specially constructed flatbed trailers. Each trailer is configured to transport combinations of up to three Type B Packages certified by the Nuclear Regulatory Commission (NRC) in accordance with 10 CFR 71 and commonly known as either the TRUPACT-II or the HalfPACT. DOE TRU waste shipment vehicles must pass a comprehensive safety inspection at the point of origin and are subject to independent mechanical and radiological inspections; procedures have been established to quickly replace or repair vehicles that malfunction. Drivers are trained in transporting radiological materials and using radiation detection instruments. The transport vehicle, when loaded, is 63.5 feet in length and 13.5 feet in height. Figure 1 on page D-5-4 depicts a truck hauling TRUPACT-II containers.
- b. Transport Containers.
 - 1) Each TRUPACT-II is eight feet in diameter and 10 feet high and will hold some 14 55-gallon drums, two standard waste boxes, or ten 85-gallon overpack waste drums. The TRUPACT-II was designed to prevent the release of radioactive materials during an accident. The Nuclear Regulatory Commission (NRC) certifies these containers, after having passed drop, fire, puncture, and water immersion tests. Figure 2 on page D-5-4 is a cutaway drawing of the TRUPACT-II.
 - 2) The HalfPACT is 8 feet in diameter and 7.5 feet high, capable of holding seven-55-gallon or four 85-gallon overpack waste drums or one standard waste box. This container has been tested to NRC standards.
 - 3) The RH-72B has been developed to transport remote handled (RH) TRU-waste. These shipments are estimated to commence during late 2006. Figure 3 on page D-5-5 is a cutaway drawing of the RH-72B container.
 - 4) The "pipe overpack" is another container used within the TRUPACT-II or HalfPACT to contain wastes contaminated with higher concentrations of plutonium and americium. The filled pipe overpack is placed inside a 55-gallon drum, which is then placed in one of the above transport containers. This container has three key functions: a) To maintain separation of fissile material to prevent an inadvertent uncontrolled nuclear chain reaction from occurring; b) To provide shielding from radiation; and c) to immobilize fine particulate waste material.

- c. **Shipment Tracking.** All TRU waste shipments will be constantly monitored by a DOE control center at the WIPP, which operates around the clock. Using satellite communications and a computer network, DOE's TRANSCOM system identifies the location of each shipment and provides two-way communication with drivers. The State Emergency Operating Center (EOC) in Austin is equipped with a TRANSCOM terminal to monitor each transuranic waste shipment. The TRANSCOM terminal can also be used by the State EOC to receive information relayed from drivers and pass information to drivers through the TRANSCOM Control Center (TCC).

5. Emergency Notification, Response, & Recovery

- a. **Notification.** Incidents involving TRU waste shipments may be discovered by local officials, reported to local officials by shipment drivers, reported by the State EOC, or DOE based on information provided over the TRANSCOM system. If local officials discover the incident, ensure that the nearest DPS facility and the DSHS/RCP are notified in accordance with Appendix 3 to this annex. The State may request DOE assistance.
- b. **Response.** The emergency response to an incident involving a TRU waste shipment should be conducted in accordance with the same accident response guidelines used for other radiological incidents; see Appendix 2 to this annex. Responders should obtain technical guidance from the DSHS/RCP by telephone until RCP staff or DOE personnel arrive at the scene.
- c. **Recovery.** Decontamination, re-entry, and recovery operations should be conducted in accordance with SOPs. Procedures may need to be modified based on guidance provided by DOE or the DSHS/RCP. DOE should assume responsibility for cleaning up any contamination that may be caused by an incident involving TRU waste shipments.

6. Training & Exercises

- a. **Training.** Training for responders and local officials relating to TRU waste shipments is available from DSHS Community Preparedness Section. DSHS Community Preparedness Section should be contacted at 512-834-6688 Extension 2021 for information on available training.
- b. **Exercises.** DOE conducts periodic exercises for state and local responders related to TRU waste shipments. State assistance is available for planning and conducting local tabletop exercises relating to TRU waste shipments. Contact the DSHS Community Preparedness Section or the Technological Hazards Group at the Governor's Division of Emergency Management for information on exercise planning.

Figure 1
Transport Vehicle with TRUPACT-II Containers

TRUPACT IIs On Loaded Transport Vehicle



Figure 2
Cutaway of TRUPACT II Container

TRUPACT-II

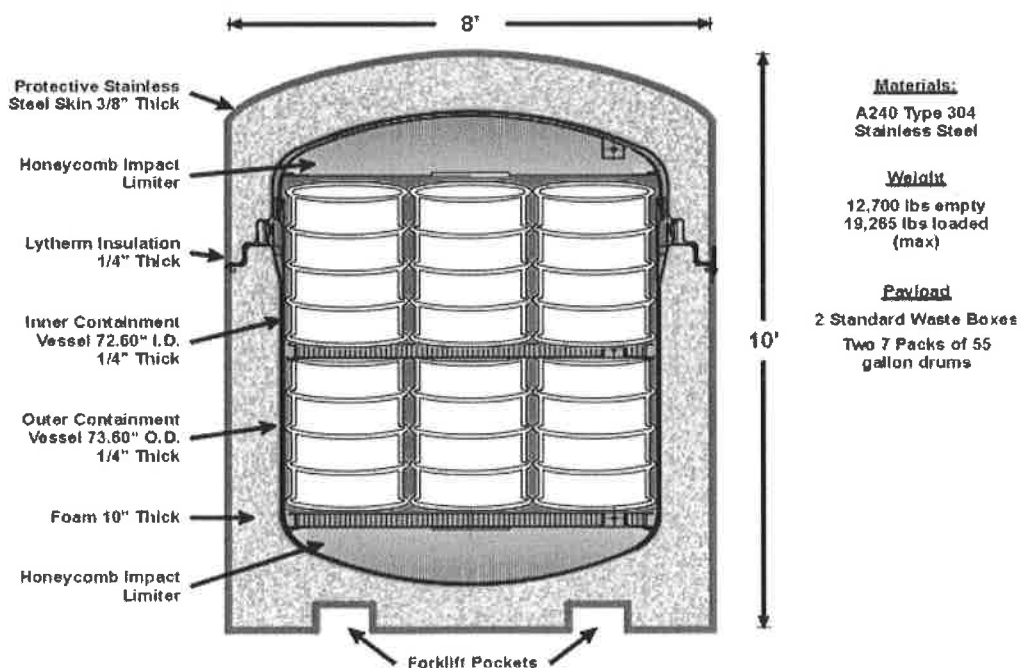


Figure 3
Cutaway of RH-72B Cask

