

## **Transition from RCRA to CERCLA as DOE Transitions to D&D**

**Catherine Alstatt, EnergX, and Christopher Gilbreath,  
Colorado Department of Public Health and the Environment  
Rocky Flats Environmental and Technology Site  
EnergX, Colorado Department of Public Health and Environment  
EnergX, 8787 Turnpike Drive, Suite 220, Westminster, CO 80030  
[Energxllc@worldnet.att.net](mailto:Energxllc@worldnet.att.net)**

**Objective:** Many DOE facilities are in an operations mode, generating wastes, even as they transition to a Decontamination & Demolition (D&D) mission. This paper discusses the transition to CERCLA as facilities enter into D&D, lessons learned regarding waste, and the potential application to other DOE sites and projects with a similar mission.

**Workshop Relationship:** Areas addressed by the paper include:

- Regulatory Issues – Transitioning from RCRA to CERCLA, including designing decision documents that will meet the requirements for non-time critical removal actions
- Waste Management Issues – Determining necessary requirements for safe waste management and developing a regulatory strategy that facilitates cost effective and timely D&D activities
- Risk Management – Using a risk-based regulatory strategy for deactivation activities
- Project Management – Transitioning from operations to project management.

**Description:** The paper summarizes collaborative efforts that have occurred at the Rocky Flats Environmental Technology Site (RFETS) to develop and implement a regulatory strategy that imposes safe, compliant waste management, which is based on risk and is designed to facilitate D&D activities. Some of the items discussed in the paper include:

- The collaborative process that was used to develop protocols for waste management, involving site personnel, the Colorado Department of Health, and the Environmental Protection Agency
- The development of Compliance Agreements and Standard Operating Procedures that facilitate conducting work safely and with fewer formal agency approvals
- The integration of existing Compliance Orders and Agreements into the D&D framework
- General assessment of what did and did not work
- Summary of overall lessons learned.

**Results:** The approach used is designed to minimize risk and maintain safety and compliance while also reducing the time and resources associated with administrative actions that are no longer required. Up front involvement by the regulatory agencies and the public has helped to reduce the amount of time necessary for obtaining regulatory approvals. Additionally, the use of Compliance Agreements has allowed for greater flexibility during D&D work.

**Benefits to Others:** The transition to D&D can be an extended process with many options and multiple pathways. The results at RFETS have shown significant savings to the facility in waste management costs while maintaining regulatory compliance and safety. This experience and corresponding lessons learned can substantially shorten the learning curve for other DOE facilities.

## **Transition from RCRA to CERCLA as DOE transitions to D&D Rocky Flats Environmental Technology Site**

Catherine Alstatt, EnergX,  
Christopher Gilbreath, Colorado Department of Public Health and the Environment

### **Introduction**

Many Department of Energy (DOE) facilities are in an operations mode and generating wastes, even as they transition to a Decontamination & Demolition (D&D) mission. This paper discusses the transition to CERCLA and the process used at the Rocky Flats Environmental Technology Site (RFETS) to develop regulatory strategies that facilitate safe, compliant waste management while supporting site closure and the transition to D&D.

### **Project Description**

RFETS is located 16 miles NW of Denver, Colorado. Operations began in the early 1950's and lasted until 1989. Its primary mission during this time was to provide support for the nuclear weapons program, including the manufacture of triggers for nuclear weapons. In 1989 the FBI and Environmental Protection Agency raided the facility based on allegations of environmental/waste mismanagement. Since that time numerous changes have occurred, including a new contractor and new mission. In 1992, RFETS's mission changed from the production of nuclear weapons components to managing wastes and materials, cleaning up, and preparing to decommission and demolish the facility.

The Rocky Flats Environmental Technology Site (RFETS) was proposed for inclusion on the National Priorities List (NPL) on October 15, 1984. The listing became final on September 21, 1989.

These actions led to the development of the Rocky Flats Cleanup Agreement (RFCA). RFCA is a legally binding agreement among the Department of Energy (DOE), the Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) designed to accomplish the required cleanup of radionuclide and other hazardous substances at and from RFETS. One purpose of RFCA is to integrate CERCLA, RCRA, and the Colorado Hazardous Waste Act (CHWA) regulatory authorities in a manner that minimizes conflict and expedites action. RFCA established single regulatory responsibilities for various activities. The EPA maintained its CERCLA authority over the Buffer Zone, which is primarily involved in environmental restoration, while delegating EPA's CERCLA authority to CDPHE for the Industrial Area, which includes all of the decommissioning activities.

RFCA dictates that decommissioning of facilities at RFETS will be performed under CERCLA removal authority. This policy encourages streamlined decommissioning by conducting these activities as "non-time critical" removal actions under CERCLA. In addition, RFCA describes the regulatory framework for performing environmental restoration and decommissioning activities and:

- Ensures timely closure of waste management units and contaminated buildings
- Delegates EPA's CERCLA authority to CDPHE (for the industrial area)
- Retains EPA authority for the final selection of remedial alternatives under CERCLA
- Requires development of a Decommissioning Program Plan.

Further, RFCA mandates that cleanup activities will be conducted in a manner that will:

- Reduce risk
- Be cost effective

- Protect public health and the environment
- Be consistent with a streamlined regulatory approach.

RFCA is a legally enforceable document and sets performance milestones on an annual basis. These milestones can cross RCRA/CERCLA authorities and may require closure of RCRA regulated units. To facilitate those efforts that cross regulatory authorities RFCA allows for increased flexibility in regulatory compliance. Three significant RCRA closure issues are included in RFCA:

- Closure of permitted and interim status units can be included in a RFCA decision document in lieu of a unit specific closure plan
- Requirements for closure of land-based and certain non-land based RCRA interim status units
- Phased closure of RCRA units.

The phased closure of RCRA units is not detailed per se in RFCA but is included in the RFETS RCRA Part B permit. This strategy allows DOE to conduct closure of a permitted unit in two stages, rendering a unit or a portion of a unit RCRA-stable, followed by completion of the final stage of closure. Once a unit is placed in a RCRA-stable configuration, formal closure of the unit is deferred until it is scheduled for final closure pursuant to the RFCA process based on budget and risk considerations.

The RCRA-stable strategy includes: 1) waste removal, elimination of future waste input, and less stringent unit management requirements (e.g. quarterly versus daily monthly inspections) and 2) unit closure and waste disposition.

RFCA details the types of required decision documents required for D&D:

- Implementation Guidance Document (IGD)
- Decommissioning Program Plan (DPP)
- Decommissioning Operations Plan (DOP)
- RFCA Standard Operating Procedure (RSOP).

The Implementation Guidance Document was developed to:

- Provide a “roadmap” for project managers
- Promote understanding and strategy of non-RFCA authority
- Standardize and expedite planning and execution of work
- Provide additional interpretation/clarification of RFCA
- Illustrate the procedures for work prioritization and budgeting.

The Decommissioning Program Plan (DPP) provided an initial characterization of the facilities at RFETS. This information was used to determine initial facility hazard classification. It also included the mechanism for decommissioning Type 1 (low hazard) facilities.

Based on the information detailed in the DPP, facilities were placed into one of three hazard categories. Depending upon the category, additional documents are required as listed below.

Type 1 facilities, Free of Contamination

- Typically trailers, offices
  - Reconnaissance Level Characterization Report (RLCR) and final survey report

Type 2 facilities, – Minor Contamination

- Some radiological and/or chemical contamination requiring decontamination

- RLCR
- Proposed Action Memorandum (PAM) or Interim Measure/Interim Remedial Action (IM/IRA)

Type 3 facilities, – Significant Contamination

- Former plutonium processing facilities
  - RLCR
  - Decommissioning Operations Plan (DOP)

At RFETS there are 375 facilities, including:

- 290 Type 1 facilities
- 79 Type 2 facilities
- 6 Type 3 facilities.

Contamination identified in these facilities includes:

- Radiological (Pu, Am, U)
- PCBs
- Chemical (solvents, acids, bases)
- Asbestos (insulation, adhesives)
- Lead, Cadmium, Chromium, Mercury
- Under Building Contamination (UBC).

Reconnaissance Level Characterization Reports (RLCRs) include the following information:

- Radiological and chemical assessment
- Facility walkdowns
- Sampling (as needed)
- Provides basis for decommissioning activities
- Facility typing (classification)
- Based on risks and other factors facilities have been divided into small, manageable groups of similar equipment and rooms that can be worked independently. The groupings are referred to as Sets.

The Decommissioning Operations Plan (DOP) describes in detail what activities will occur in a facility to complete decommissioning. It lists specific hazards associated with each Set and gives an overview of the regulatory strategy for the activities. In some instances a waste management plan is included which details the strategy for handling wastes including identified Applicable and Relevant and Appropriate Standards (ARARS) under CERCLA. The DOP may also include the requirements from RCRA Compliance Orders on Consent (COOC), which then supercede the original order. This document requires CDPHE approval prior to issuance. Specific information to conduct closure of RCRA regulated units may also be included in place of a separate closure plan.

RFCA also allows for the use of Standard Operating Procedures (RSOPs) to facilitate accelerated actions that are routine and substantially similar in nature for which standardized procedures can be developed. An example would be a generic plan for cleaning and rendering tanks inert. The review and approval process as well as the public comment period for these documents is the same process as for the IM/IRA process.

## **Regulatory Issues**

Many of the facilities at RFETS still have on-going operations (waste processing, repackaging) even as they transition to a Decontamination and Decommissioning (D&D) mission. In order to determine the required regulatory authority it is necessary to define what activities are within the scope of RFCA. By definition deactivation activities are outside the scope of RFCA while decommissioning activities are regulated under RFCA.

Deactivation is defined as the process of placing a facility in a safe and stable condition to minimize the long-term cost. Actions include the removal of fuel, de-energizing of non-essential systems, and removal of stored radioactive and hazardous materials and related actions.

Decommissioning is defined as those activities that occur after deactivation and includes surveillance and maintenance, decontamination and/or dismantlement.

## **Regulatory Framework**

As cited earlier, decommissioning of facilities at RFETS will be performed under CERCLA removal authority. How to best integrate these requirements into the current regulatory management stream is currently undergoing negotiation between the site and CDPHE. As described later in the lessons learned section, one of the facilities, Building 779, did manage its wastes as CERCLA. However, this facility did not have any wastes that were generated prior to beginning decommissioning and, therefore, it was easier to implement a CERCLA waste management strategy. Therefore, at the present time RFETS is managing all wastes in compliance with both the substantive and administrative requirements of environmental regulations. Work is ongoing on a waste management strategy that details how wastes from remedial actions will be managed.

One of the continuing issues that needs to be fully resolved involves the management of items that, when determined to be waste, would be hazardous waste. It is difficult to determine at what point some of these items become waste (e.g. computer components, circuit boards). Did this equipment become waste in 1992 when the decision was made to close RFETS, or does it become waste when it has been determined formally that there is no future use. The risk from most of these types of waste is minimal. A management strategy is being discussed with CDPHE to determine if alternative waste management practices can be used. Some proposed practices include creating areas where these wastes can be located until sufficient quantities can be accumulated to screen for radiological contamination and packaging. The areas would be labeled and non-essential personnel restricted from access but the inspection and packaging requirements would be limited.

## **RCRA Regulatory Strategy**

CDPHE and RFETS have implemented several compliance agreements to facilitate management of RCRA regulated wastes until D&D and RCRA closure. These orders include:

- Idle Equipment
- Tank Management
- Waste Chemicals.

In 1992 when the mission changed hundreds, if not thousands, of pieces of equipment became idle. Regulatory requirements state that any material left in the equipment is to be characterized. If it is hazardous, the equipment is to be emptied and the waste appropriately managed. With so many pieces of equipment containing material it would have been virtually impossible to meet the regulatory timeframe.

Under the Idle Equipment Order on Consent, the waste in the equipment was characterized and a prioritization was made based on risk. A schedule for removal was then developed based on this risk. The same process was used to determine management of interim status tanks. Additional requirements, including labeling and conducting inspections as appropriate, were also mandated. As with idle equipment, numerous chemicals were no longer needed when the mission changed. Many of these could not be free released from a radiological perspective and, therefore, became waste. A compliance order on consent similar to the idle equipment order was implemented.

As stated earlier, the RCRA permit allows for a phased closure of RCRA permitted tanks, including placing a portion or an entire tank system into RCRA stable condition and deferring final closure until the Set in which it is located is scheduled for D&D. Since many tank systems cross several Set boundaries, there is a proposal to submit closure documentation for all RCRA permitted tank systems at one time, including Set numbers. Only agency notification is required prior to work being conducted.

Some wastes will be subject to RCRA regulation even if the actions occur during D&D activities:

- Wastes currently in storage (legacy wastes)
- Wastes within idle equipment
- RCRA closures that are conducted with a closure plan.

### **CERCLA Regulatory Strategy**

Remediation wastes (CERCLA regulated) include:

- Wastes generated from activities conducted under an approved RFCA decision documents (DOP, RSOP)
- Solid and liquid waste chemicals.

Proposed CERCLA Waste Management Requirements:

- Waste storage in designated remediation waste storage units
- Generator treatment (e.g. addition of absorbent) may be performed without prior Lead Regulatory Agency (LRA) approval
- Other types of treatment may be performed in remediation treatment units approved by the LRA upon submittal of a field modification to the DOP
- Observations of these remediation management units will be conducted and documented.

### **Accomplishments**

1. RFETS has completed D&D on several facilities, including demolition. In 1999 work was completed on demolition of the first major plutonium contaminated building (Building 779). Three Type 2 buildings also completed D&D to demolition.
2. Work is currently ongoing in several buildings including two Type 3 buildings, Buildings 771/774 and 776/777. These building are significantly more complex than Building 779.
3. Two other major buildings will begin D&D in the near future. They are currently involved in processing legacy waste to prepare for shipment. These are Buildings 707 and 371.

## **Lessons Learned**

1. Building 779 was the first major (Type 3) plutonium facility to successfully undergo D&D to demolition. The wastes generated from this activity were managed under CERCLA, as allowed. The facility established only two storage areas for remediation waste (inside the building and outside the building). This decreased the time needed to track and inspect the waste.
2. The inclusion of RCRA regulatory requirements associated with RCRA unit closures and Compliance Orders on Consent into RFCA decision documents should improve understanding of compliance with these requirements by minimizing the number of reference documents required.

## **Remaining Actions**

For the Building 779 project, having dedicated project personnel, instead of matrixed personnel, improved project understanding and implementation. RFETS is currently undergoing a major reorganization that is designed to projectize the entire site.

One of the major challenges for the Building 779 project was the logistics of waste handling, movement and storage. RFETS needs to finalize a site-wide RCRA/CERCLA waste management plan that will provide facilities the flexibility to manage waste based on risk. Currently, printed circuit boards and waste leaded gloves require the same level of management as containers of TRU-mixed waste. A strategy needs to be developed that will dictate proper management for wastes with little risk, but which still must be ultimately managed as hazardous or mixed wastes.

Waste management strategies will also be more complicated in remaining buildings due to the significant amount of stored legacy waste that needs treatment and/or repacked and the level of deactivation that still needs to occur in these buildings. The contamination levels in these buildings are much greater and the size, type and amounts of equipment located in these buildings creates a significantly greater challenge. The amount and types of wastes to be generated from these buildings will require a tremendous amount of effort to properly characterize, package, and stage these wastes within the building. Coordination and logistics of waste handling strategies for waste handling, storage, and shipments will be a constant challenge, especially as several buildings enter into D&D full scale and begin to generate significant quantities of waste. Wastes will then need to be moved from the buildings almost as soon as generated to facilitate D&D activities. A site-wide waste management plan detailing waste generation rates, amounts, and types must be accurately maintained. From this information a logistics plan for waste handling including coordination of waste movement on-site, storage areas, and definition of off-site disposal facilities must be developed and implemented.

Further, although Building 779 did manage its wastes as CERCLA, the building was only conducting D&D activities. This made it fairly easy to implement a CERCLA waste management strategy. The remaining former production buildings will have to develop a waste management strategy that differentiates between process wastes (legacy wastes, wastes generated from RCRA regulated activities), which are subject to full RCRA regulation and remediation wastes, wastes generated from defined decommissioning activities, which are CERCLA wastes. This will be an added complexity to waste management, which is yet to be implemented at the site.

## **References**

CDPHE, 1997, RFETS RCRA Permit, Permit No. CO-97-05-30-01, June 1997.

EPA, 1980, Superfund Amendments and Reauthorization Act, Section 121(d) as amended CERCLA 42 USC S 9601 et seq, US. Environmental Protection Agency

EPA/CDPHE/DOE, 1996, Final Rocky Flats Cleanup Agreement, CERCLA VIII-96-21, RCRA [3008(h)] VIII-96-01, State of Colorado Docket #96-07-19-01, July 19, 1996.