

THE SEQUENTIAL DECONTAMINATION OF AN ABANDONED URANIUM FABRICATION FACILITY

R. R. Land and R. M. Allen
Bechtel National, Inc.
Oak Ridge, TN

ABSTRACT

In 1984, Congress authorized the Department of Energy (DOE) to conduct a decontamination research and development project at four sites, including a property in Colonie, New York, that was formerly owned by National Lead Industries (NLI) and is now referred to as the Colonie Interim Storage Site (CISS). The site covers 4.5 ha (11.2 acres) and includes the plant building [1,023 m² (11,000 ft²)] and two smaller storage buildings.

As a result of NLI operations, the plant buildings, grounds, and vicinity properties became contaminated. The contaminants can be divided into four categories: asbestos, hazardous wastes, low-level radioactive waste (LLRW), and mixed LLRW.

The decontamination of the site will be implemented in seven sequential phases and will be carried out under various authorities and with differing categories of response activity. The governing authorities for CISS include the National Environmental Policy Act (NEPA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Resource Conservation and Recovery Act (RCRA). This paper discusses the relationship between each phase of the proposed restoration activity and the collective requirements of NEPA, CERCLA, and RCRA.

INTRODUCTION

The Colonie facility was built in 1923 as a wood products and toy factory. In 1927, the site was converted to a brass foundry. In 1937, the plant was purchased by NLI, which continued to operate the facility as a brass foundry until 1958, when the company began manufacturing uranium products under an Atomic Energy Commission (AEC) license. Between 1958 and 1968, NLI held numerous AEC contracts for fabrication of slightly enriched uranium fuel elements and chemical processing of nonirradiated, slightly enriched uranium scrap. After termination of the AEC contracts, work was limited to fabrication of shielding components, ballast weights, and projectiles from depleted uranium.

In 1980, the New York State Supreme Court issued a temporary restraining order that allowed NLI to continue operating, but required the company to initiate an independent investigation to assess all adverse environmental conditions in soils and on vicinity properties that may have been caused by the airborne discharge of radioactive particulates from the plant.

In 1983, 1984, and 1985, Oak Ridge National Laboratory (ORNL) conducted radiological surveys of the residential and commercial properties in the vicinity of the plant. In 1984, after Congress directed DOE to conduct a decontamination research and development project at the site, NLI donated the Colonie plant to DOE for use as an interim storage site for contaminated materials removed from the affected vicinity properties.

Following acquisition of the site, the Environmental Protection Agency (EPA) requested that DOE submit a revised RCRA Part A application. (NLI had previously filed an application and had been granted interim status as a storage facility for hazardous chemical wastes.) At the time of the property transfer, the site contained radioactively and non-radioactively contaminated chemical wastes. To date, most of the nonradioactive chemical wastes have been shipped offsite for disposal.

The Colonie site was added to the Formerly Utilized Sites Remedial Action Program (FUSRAP) by DOE after Congress authorized DOE to conduct remedial action at the site. FUSRAP is a program managed by DOE to identify and clean up or otherwise control sites where residual radioactive contamination (exceeding current guidelines) remains from activities carried out under contract to the Manhattan Engineer District and AEC.

The site is contaminated with asbestos, hazardous wastes, LLRW, and mixed LLRW. The contaminants are found in insulation and building materials, foundry process wastes, machinery, waste oils, laboratory equipment, soils (surficial and buried), treated and solidified electroplating wastes, trash, and debris. In addition, approximately 1,148 m³ (1,500 yd³) of contaminated soil from the remediation of 53 vicinity properties is stored in an interim storage pile in the main plant building.

Restoration of the site under FUSRAP will be implemented in the following seven sequential phases:

- Removal and disposal of mixed LLRW
- Site preparation
- Removal and disposal of containerized LLRW and RCRA waste
- Asbestos removal
- Housekeeping and preparation for decontamination and dismantlement
- Building decontamination and dismantlement
- Burial area cleanup, building slab demolition and cleanup, and final site cleanup

The success of the remedial effort will depend partly on a thorough understanding of the role each governing statutory authority plays in the selection of remedial alternatives (1). The governing authorities for CISS are NEPA, CERCLA, and RCRA.

REGULATORY BACKGROUND

National Environmental Policy Act

NEPA is often referred to as the "Grandfather" of environmental laws. It was established in 1970 and required all federal agencies to consider and document human health/welfare and environmental impacts during decision-making processes. This detailed statement is presented in an environmental impact statement (EIS). The EIS requirement places the responsibility on federal agencies to evaluate the environmental effects of their decisions so that use of the environment is planned and controlled rather than haphazard. Another function of the EIS is to inform the public of the environmental consequences of proposed federal actions. The major steps in the NEPA process are as follows (2):

- Determination of need
- Notice of intent
- Scoping meeting
- Implementation plan
- EIS preparation and review
- Record of decision (ROD)

A categorical exclusion (CX) to the requirements of NEPA is granted for actions that will not have a significant effect on human health or the environment. Exclusions eliminate the need for an environmental assessment or an EIS. In DOE's NEPA guidelines, CXs are limited to classes of actions that are implemented clearly in accordance with applicable statutory requirements and permits; do not involve construction or expansion of waste disposal, recovery, or treatment facilities; and affect only areas previously determined not to be environmentally sensitive areas. Sensitive areas include archeological sites, critical habitats, floodplains, wetlands, and sole source aquifers.

Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA was established in 1980 with the primary purpose of implementing a program for the cleanup of abandoned or uncontrolled waste sites. It requires that decisions on site remediation be made through a formal process called a remedial investigation/feasibility study (RI/FS). The RI is the mechanism used to collect data about site conditions and the particular contaminants involved and determine the risk of those contaminants to human health and the environment. The FS serves as the mechanism to develop, screen, and evaluate alternative remedial actions. The RI and the FS are designed to be conducted concurrently. The data collected in the RI influence the selection of the "best" remedial alternative during the FS. Likewise, the development of alternatives in the FS affects how data are collected in the field during the RI (3).

The major steps in the CERCLA process are:

- Site discovery and notification
- Site characterization
- RI/FS
- Proposed plan and ROD
- Remedial design and remedial action

Resource Conservation and Recovery Act

RCRA establishes a system for controlling waste from the time it is generated until its final disposal. The objective of Subtitle C (one of the four programs established under RCRA) is to ensure that hazardous waste is handled in a manner that protects human health and the environment. Subtitle C regulations also address the generation, transportation, and treatment, storage, or disposal of hazardous wastes. In addition, Subtitle C determines the technical standards for the design and operation of disposal facilities.

CERCLA/NEPA Process

Prior to the Superfund Amendments and Reauthorization Act (SARA), FUSRAP activities were conducted in accordance with the requirements of NEPA. With the enactment of SARA, CERCLA was amended and the responsibilities of federal agencies under CERCLA were clarified. Thereafter, DOE developed an approach to comply with the requirements of both CERCLA/SARA and NEPA; this approach is referred to as the CERCLA/NEPA process.

In October 1989, DOE Order 5400.4 called for the integration of CERCLA and NEPA requirements for DOE restoration actions under CERCLA. Integration may be accomplished by conducting the NEPA and CERCLA activities concurrently to avoid duplication of effort, conflicts in analysis and selection of remedial alternatives, and procedural delays.

Although EPA has not yet promulgated a process for selecting RCRA restoration measures, RCRA requirements are very similar to those of CERCLA. It is assumed that an integrated CERCLA/NEPA/RCRA process would be much the same as the CERCLA/NEPA process already in place.

Regulatory Constraints

Two important items of concern that directly impact the schedule for the decontamination work at CISS are the RCRA permit discussed earlier and the federal land ban restrictions (4). On May 8, 1990, EPA promulgated regulations implementing the final prohibitions on land disposal of hazardous wastes. Although the restrictions were effective when promulgated, DOE proved that CISS was in compliance with RCRA and successfully applied for a two-year national capacity variance. The variance will expire on May 8, 1992; thereafter, burial of the mixed waste from CISS without extensive and costly pretreatment will be prohibited.

The RCRA permit allowing CISS to serve as an interim storage facility for hazardous chemical wastes will expire in November 1992. Within 90 days of the expiration date, all RCRA wastes including mixed LLRW must be removed from the site and the site must be closed as a RCRA facility. Failure to comply could result in fines for violation of RCRA.

DECONTAMINATION PROCESS

Removal and Disposal of Mixed LLRW

All containerized mixed LLRW will be removed and transported to an existing disposal facility that has all required state and federal permits. CISS currently has in storage approximately 212 containers of mixed LLRW of varied constituency. Transportation (including packaging, placarding, and manifesting) will be in accordance with all applicable Depart-

ment of Transportation (DOT) and EPA regulations. Because it is both hazardous and radioactive, mixed waste is subject to both Nuclear Regulatory Commission (NRC) requirements and EPA requirements under RCRA.

A CX for this activity has been issued. The exclusion is appropriate because the removal action will be implemented in accordance with applicable statutory requirements and permits; will not involve construction or expansion of waste disposal, recovery, or treatment facilities; and will not affect areas previously determined to be environmentally sensitive. This action is also categorically excluded pursuant to the following language contained in the referenced September 7, 1990, Federal Register notice: "Removal of drums, barrels, tanks, or other bulk containers that contain or may contain substances identified with the definition of hazardous substances under Section 101(14) of CERCLA, or pollutants or contaminants as defined by Section 101(33) of CERCLA, or hazardous wastes under 40 CFR Part 261, where such actions would reduce the likelihood of spillage, leakage, fire, explosion, or exposure to humans, animals, or the food chain."

Site Preparation

Site preparation will include the erection of storage facilities and temporary field offices with potable water and sewer services. Most of the permanent plant electrical systems will be deenergized, and a construction electric power distribution system will be installed. Several plant electrical systems will remain energized to maintain the security system required by the RCRA permit. Control areas and facilities for waste treatment and equipment decontamination will be established during this phase. An exhaust system will be installed in the main plant building to control air flow and minimize fugitive releases of airborne contaminants.

Installation of the water and sewer lines and the construction electric system will be subject to all applicable local and state codes and standards.

Removal and Disposal of Containerized LLRW and RCRA Waste

During this phase, all containerized LLRW and RCRA waste will be identified and packaged, if necessary. The RCRA material will be disposed of as soon as an appropriate disposal site has been identified. Disposal of the LLRW will occur following the publication of the ROD.

The RCRA waste, like the mixed LLRW, is categorically excluded from documentation requirements under Section D of the DOE NEPA Guidelines. Removal and disposal of the LLRW will be regulated by NRC.

Asbestos Removal

Work will involve the removal and packaging of radioactive asbestos-contaminated material (ACM). Specific tasks will include the removal of insulation (from pipes, boiler tank, and furnace), floor tiles, transite siding, and transite ceiling tiles. All ACM will be removed from the main plant building. No attempt will be made to identify and segregate ACM that is not radioactively contaminated. The assumption is that all ACM is radioactive; therefore, ACM will be stored onsite until the final disposition of all waste for the site has been determined.

The work will be covered by a CX and will be conducted in accordance with applicable state and federal rules and regulations, including certification of removal contractors and technicians. Other applicable regulators are the Occupational Safety and Health Administration (OSHA), National Emissions Standards for Hazardous Air Pollutants (NESHAPs), and the New York State Department of Environmental Conservation (NYSDEC).

Housekeeping and Preparation for Decontamination and Dismantlement

The objectives of this task are as follows:

- Lower the level of contamination within the facility such that building dismantlement may proceed without risk to the health and safety of the workers and the general public
- Reduce the volume of contaminated equipment, building components, and debris
- Decontaminate equipment and components to allow resale/recycling as scrap metal or burial in a sanitary landfill
- Remove building systems, subsystems, and non-load-bearing structural supports. As previously mentioned, portions of the plant electrical system must remain intact as long as the RCRA permit is valid. In addition, DOE has requested that the fire suppression system remain operational until the building has been demolished. Only the building framework, the slab, and the existing waste pile will remain after this activity.

A CX will be applied to all removal actions performed during this phase. The wastes will be categorized as RCRA waste, LLRW, or mixed LLRW and will be disposed of accordingly.

Building Decontamination and Dismantlement

The ROD, based on the RI/FS for decontamination and dismantlement of the main building frame and slab and the two storage buildings, will determine the remedial actions to be taken.

Burial Area Cleanup, Slab Demolition, and Final Site Cleanup

Several burial areas on the CISS property are known to contain buried LLRW and mixed LLRW. In addition, the main building slab became contaminated during plant operations. The ROD will specify the appropriate remediation for restoration of the burial areas, removal of the waste pile, demolition of the slab, and final site cleanup.

CONCLUSIONS

This paper has attempted to demonstrate that the technical complexity of environmental restoration activities is further compounded by the quantity of environmental law emanating from the United States Constitution; state constitutions; federal and state statutes and local ordinances; and regulations promulgated by federal, state, and local regulatory agencies. Further, as in the case of dual (EPA and NRC) regulation of mixed LLRW, activities dealing with a waste stream must satisfy the requirements of all applicable statutes.

The need to comply with multiple regulations that apply to site activities affects both technical and administrative aspects of site remediation and waste management. Obviously, therefore, careful attention to all applicable laws and regulations is required to ensure that management of all hazards is both technically adequate and in full compliance with legal requirements. Early identification of regulatory requirements can minimize the risk of carrying out a remedial action in response to the demands of one agency, only to find later that another agency will impose additional requirements.

REFERENCES

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