

DISPOSAL PATH FOR SOLIDIFIED PCB-CONTAMINATED TRU MIXED WASTE

C. Zvonar
U.S. Department of Energy, Carlsbad Field Office
Waste Isolation Pilot Plant

R. Steger
Portage Environmental, Inc., Carlsbad Field Office Technical Assistance Contractor
Waste Isolation Pilot Plant

E. Ward
BWXT-Pantex, Formerly Portage Environmental, Inc.

ABSTRACT

This paper describes the course of action that the Department of Energy (DOE) followed to secure a disposal path for solidified polychlorinated biphenyl (PCB) contaminated transuranic (TRU) waste. This arduous process began over ten years ago when the DOE first began seeking the necessary state and federal regulatory approvals. In order to secure a disposal path for this waste stream the DOE worked with several state and federal regional regulatory agencies including, the Environmental Protection Agency (EPA) Headquarters, EPA Regions VI and X, the Idaho Department of Environmental Quality (IDEQ) and the New Mexico Environment Department (NMED). The final solution consisted of the DOE Carlsbad Field Office (CBFO) receiving a favorable regulatory determination from EPA Headquarters, a chemical waste landfill authorization from EPA Region VI, and approval by the NMED of a permit modification request to remove the prohibition on TRU waste with PCB concentrations ≥ 50 parts per million (ppm) from NMED.

INTRODUCTION

The current TRU/PCB waste inventory, which was generated as a result of the industrial legacy of the nuclear weapons program, includes solidified TRU/PCB waste such as PCB-contaminated hydraulic and dielectric fluids as well as limited quantities of other PCB-contaminated debris. This debris consists of coveralls, rubber gloves, lead-lined panels, plywood, failed equipment, stainless steel and other metal piping, and metal hold-down strips. Most of the approximately 2000 cubic meters (m^3) of solidified TRU/PCB waste inventory resulted from plutonium machining, tool degreasing activities, or cleanup and decontamination activities primary at the Rocky Flats Environmental Technology Site (RFETS). The waste was generated as a liquid and was solidified to produce a stable immobilized waste form that contained the plutonium contaminants and to promote safe, secure storage, handling, and transportation. The majority of this waste, which was generated at the RFETS, was shipped to the Idaho National Engineering and Environmental Laboratory (INEEL) for subsurface disposal in the 1960s and for long-term storage beginning in the early 1970s. Limited quantities of previously solidified PCB wastes are stored at Hanford and other DOE sites.

The key issue from a Toxic Substances Control Act (TSCA) perspective was that PCB liquids at concentrations ≥ 50 ppm must be disposed of in an incinerator with exceptions for PCB liquids at concentrations ≥ 50 ppm and < 500 ppm [Title 40 Code of Federal Regulations Section 761.60 (40 CFR §761.60)]. Whereas, non-liquid PCB Remediation Waste can be disposed of by

incineration, an alternate destruction method equivalent to incineration (i.e., high efficiency boiler), or in a chemical waste landfill [40 CFR 760.61(b)(2)(i)].

The DOE's initial path forward was to incinerate the PCB waste inventories (disposal through destruction). This method would have eliminated the need to determine which waste streams may contain liquid PCB's at concentrations ≥ 50 ppm. The DOE, however, abandoned this approach after stakeholders at INEEL began formally opposing thermal treatment, particularly incineration, see below section titled "Summary of Regulatory Efforts at the INEEL." The DOE then began exploring alternative disposal paths including the Waste Isolation Pilot Plant (WIPP). This path-forward, however, was not without obstacles. The primary issue for disposal at the WIPP was whether the largest TRU/PCB waste stream, liquid (solidified) mixed waste, met the TSCA definition of remediation waste, see below section titled "Summary of Regulatory Efforts at the WIPP."

SUMMARY OF REGULATORY EFFORTS AT THE INEEL

As previously stated, the DOE's initial path forward was to destroy the PCB waste inventories by incineration (disposal through destruction). The DOE put significant effort into siting and permitting a TRU mixed waste incinerator at the INEEL associated with the Advanced Mixed Waste Treatment Project (AMWTP) because the majority of the solidified TRU/PCB waste inventory was located at the INEEL. There is also a significant amount of other organic homogeneous sludge and debris wastes (paper, rags, plastic, and rubber) stored at the INEEL and throughout the DOE Complex that do not contain PCBs which could have been destroyed through incineration at the INEEL. Because these waste streams were TRU mixed, meaning TRU waste that is also a regulated hazardous waste, and TRU/PCB waste, the AMWTP incinerator would require both a hazardous waste facility permit from the IDEQ and a TSCA permit issued by EPA Region X. The DOE strategy and planning related to the AMWTP culminated in a contract award to BNFL Inc. on October 1, 1996. EPA Region X and IDEQ agreed to cooperatively administer a determination on a joint RCRA/TSCA incineration permit application and became engaged in early 1997. Progress on the application which included the development and review of a cumulative (radiological and hazardous) risk assessment, lead to a draft permit which was proposed for approval and distributed to the public to review. Stakeholders formed groups that were supported by national groups absolutely opposed to any/all thermal treatment particularly incineration. DOE opted to withdraw their RCRA/TSCA incineration applications prior to the agencies making a final determination. This effectively left all of the TRU/PCB waste, including the solidified sludge, without a viable disposal path.

SUMMARY OF REGULATORY EFFORTS AT THE WIPP

The CBFO began working on a regulatory path to dispose of PCB-contaminated transuranic (TRU/PCB) mixed waste at the WIPP in early 2000. This presented some interesting dilemmas for the CBFO because the WIPP is the first deep geological salt repository of its kind and did not fit specifically within the TSCA regulations. The WIPP Hazardous Waste Facility Permit (HWFP), issued by NMED, identifies the repository as a miscellaneous unit, not a landfill. For example, concerns associated with basic landfill design and operational differences related to soils/synthetic liners, leachate collection, hydrologic conditions and groundwater monitoring (the uppermost regional water-bearing zone is at an elevation above the WIPP repository, not below). To resolve the TRU/PCB waste and landfill concerns, the CBFO began coordinating with DOE Headquarters, EPA Headquarters and EPA Region VI to determine what type of TSCA application should be submitted to the EPA (i.e., a chemical waste landfill application, a risk-based application, or a hybrid).

The CBFO considered and started down several different regulatory pathways to dispose of TRU/PCB waste at the WIPP before the issue was resolved when CBFO was advised by EPA to submit a chemical waste landfill application to EPA Region VI pursuant to 40 CFR §761.75. The primary obstacle to dispose of TRU/PCB waste at WIPP was EPA Region VI's reluctance to address solidification of liquids, or the disposal of previously solidified PCB liquids at the WIPP. Preparing the TSCA chemical waste landfill application and demonstrating how the WIPP site and repository exceeded the technical requirements for a chemical waste landfill was much easier to address than the differences of opinion between EPA Headquarters and Region VI on solidified TRU/PCB waste.

As such, CBFO's largest hurdle was to obtain concurrence from the EPA that DOE's solidified TRU/PCB inventory, approximately 2000 m³, met the TSCA definition of remediation waste. This was important because the TSCA regulations define specific waste streams that may be disposed of in a chemical waste landfill, (40 CFR §761 Subpart D), and the solidified TRU/PCB waste did not fit specifically into any of the TSCA categories. Therefore, EPA's concurrence became a determining factor in whether the CBFO could dispose of solidified TRU/PCB waste once it received a chemical waste landfill authorization or whether once again it would appear that incineration would be required.

CBFO'S POSITION PAPER - RE: THE DEPARTMENT OF ENERGY'S (DOE) LEGACY SOLIDIFIED TRU/PCB WASTE INVENTORY MEETS THE TSCA DEFINITION OF REMEDIATION WASTE PURSUANT TO 40 CFR §761.3

Initially, the CBFO received two different answers from EPA Headquarters and EPA Region VI on whether solidified TRU/PCB waste could be categorized as remediation waste. EPA Region VI stated in a letter dated October 16, 2000, that solidified liquids are not allowed in an approved PCB disposal facility. In a very different response, EPA Headquarters stated during both a February and April, 2001, teleconference (not in writing) that the previously solidified TRU/PCB waste would be considered remediation waste, hence allowed in an approved PCB disposal facility. As a result of the conflicting responses between the EPA regional and headquarters offices, the CBFO prepared and sent a position paper to EPA Region VI on June 21, 2001, which specified the regulatory authority for classifying the solidified TRU/PCB waste as TSCA remediation waste.

CBFO's position paper established that the TSCA definition of remediation waste encompassed the legacy solidified TRU/PCB waste inventory because the waste was solidified prior to the effective date of the TSCA regulations. The waste would therefore have been in a solid state when the regulations became effective and would have been regulated as non-liquid waste. The solidification did not dilute¹ the original PCB concentration; rather, it provided a means to contain the TRU/PCB waste until an acceptable disposal path was identified. Further, the solidification was not done to avoid treatment requirements, but to produce a stable, immobilized waste form that contained the plutonium contaminants and allowed for safer storage, handling, and transport.

EPA Region VI deferred response to CBFO's Position Paper to EPA Headquarters. EPA Headquarters issued a policy letter to the DOE on February 28, 2002, stating that TRU/PCB wastes that were generated at the Rocky Flats Environmental Technology Site and solidified as required for transportation and storage fall within the TSCA definition of PCB remediation waste. Specifically, the letter stated that these solidified wastes fall within the definition of PCB remediation waste which includes: industrial sludges, non-liquid cleanup materials, including but not limited to, coveralls and rubber gloves; and debris generated during the process of sludge

management. Also, the policy letter included within the definition of PCB remediation waste the small amount of similarly solidified TRU waste generated at other DOE facilities. The letter did not allow for the disposal of TRU/PCB liquid sludges. This was an important milestone for the DOE in its efforts to identify a regulatory path forward for disposal of this troublesome waste stream. The CBFO subsequently submitted a Chemical Waste Landfill application to EPA Region VI on March 22, 2002, received approval on May 15, 2003. On September 16, 2003, the CBFO received approval of a Class 2 permit modification request from NMED removing the PCB prohibition from the Hazardous Waste Facility Permit.

CONCLUSION

As previously stated, the most difficult aspect of this project once DOE/CBFO became involved was resolving the issue of the classification of the solidified TRU/PCB waste. The most obvious lesson-learned from this experience was, when seeking a regulatory policy determination, take care to find the most knowledgeable and hopefully reasonable regulatory resource available. In this case Dr. John Smith, EPA Headquarters, co-author of the TSCA/PCB “Mega Rule” was exactly in tune with resolving the legacy solidified TRU/PCB issue by defining it as remediation waste making WIPP a viable solution.

FOOTNOTES

ⁱ The anti-dilution provision in the TSCA regulations was used to eliminate any incentives a party would have to dilute PCB-containing media to qualify for a less expensive disposal or treatment option, 40 CFR §761.1(b)(5). The specific provision reads that: “No provision specifying a PCB concentration may be avoided as a result of any dilution, unless otherwise specifically provided.”