

ANALYSIS OF THE IMPACTS OF THE 1984
RESOURCE CONSERVATION AND RECOVERY ACT AMENDMENTS
ON THE IDAHO NATIONAL ENGINEERING LABORATORY^a

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ABSTRACT

The November 1984 Amendments to the Resource Conservation and Recovery Act (RCRA) have had, and will continue to have, a significant impact on the management of hazardous and radioactive mixed waste at the Idaho National Engineering Laboratory (INEL). These Amendments include new requirements specific to federal facilities such as the INEL.

In this paper, areas of direct impact and associated INEL plans for complying with the 1984 RCRA Amendments will be described. The specific areas to be covered are the following: (1) changes in RCRA Part B permitting, including requirements for addressing past hazardous waste TSD sites; (2) the effects of increased restrictions on land disposal; (3) new requirements for underground tanks; (4) requirements for federal facilities; and (5) mandatory minimization of waste generation.

BACKGROUND

EG&G Idaho, Inc., as a prime operating contractor for the INEL, implemented a program beginning in 1984, to establish compliance with RCRA-mandated regulations for both hazardous and radioactive mixed waste. Radioactive mixed waste is defined as radioactive waste that also meets the definition of a hazardous waste under 40 CFR Part 261. Currently, all hazardous waste generated at the INEL is consolidated in a permitted storage facility and then transported off site to a RCRA-permitted treatment, storage, and/or disposal (TSD) facility. Radioactive mixed waste generated at the INEL is being stored on site in a permitted facility until options for treating these wastes in accordance with EPA requirements for hazardous waste and DOE requirements for radioactive waste can be implemented. A Part B permit application has been submitted for the on-site TSD of hazardous and radioactive mixed wastes in two storage facilities and two waste treatment facilities.

The purpose of this paper is to describe the additional impacts on INEL hazardous waste operations as a result of the November 1984 RCRA Amendments. Major areas of impact, discussed in detail below, include: (1) RCRA Part B permitting, including requirements for addressing past hazardous waste TSD sites; (2) increased restrictions on land disposal; (3) regulations for underground storage tanks; (4) specific requirements for federal facilities; and (5) mandatory programs for minimization of waste generation.

RCRA PART B PERMITTING

The INEL received EPA's formal request for a Part B Permit application in a letter dated April 15, 1985. The INEL had six months in which to prepare and

submit the application. After several scoping meetings, including an on-site meeting with the EPA Region X permit writer, it was decided which TSD facilities needed to be included in the application in order for the INEL to effectively continue hazardous waste (HW) operations. The application was eventually submitted on October 17, 1985, and addressed (1) an existing storage facility for HW, (2) a proposed storage facility for radioactive mixed waste (RMW), (3) modifications to an existing incinerator at the Waste Experimental Reduction Facility (WERF) for burning HW and RMW, and (4) a new operation, also at WERF, for the solidification or stabilization of HW and RMW. Integral to the incinerator process was a proposed storage and blending unit (tanks) for liquid waste prior to its being incinerated.

Although it took a considerable effort to put together an application, the work was accomplished and from the early comments received following EPA's review of our application, the main portion of the application is in excellent shape. The problems that the INEL now faces, however, are due to regulatory requirements associated with the permitting process rather than solely with the permit itself. As required in the 1984 Amendments to Section 3005 (e) of RCRA, "Interim Status," the INEL has lost interim status on any land disposal units not included in the Part B permit application. Section 3004 (u) of RCRA, "Continuing Releases at Permitted Facilities," was added by the 1984 Amendments and also impacts the INEL because of the permit application.

Under the new Section 3005 (e), interim status on land disposal units terminated as of November 8, 1985 (twelve months after the effective date of the 1984 Amendments) unless the owner or operator had submitted (1) a Part B permit application for the unit, and (2) a certification that the unit was in compliance with all applicable groundwater monitoring and financial responsibility requirements. The loss of interim status provides particular problems for DOE facilities because it covers TSD units which were

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operated after 1980 under declared exemption to RCRA. When the judicial process determined that DOE's position was incorrect, the HW operations were ceased, but past sins were not forgiven.

Since submission of the Part B Permit application, the INEL has received an EPA request for information pursuant to Section 3007 of RCRA. (Section 3007 simply states that requested compliance information will be submitted.) The request concerned all land disposal units (landfills, surface impoundments, land treatment units, and waste piles) that received waste after November 19, 1980. The information requested included all operating plans that were to have been developed for TSD facilities operating under interim standards, including closure plans. Needless to say, since the applicable units were never intended to be operated as interim-status units, no such plans existed. Thus far, it has been the INEL's position to submit overview closure plans and existing, related plans to show that the interim-status units (surface impoundments or ponds, as a common example) were not operated indiscriminately.

The closure plans were not detailed because they were newly generated and because little time was allowed for their preparation. Almost twenty closure plans were submitted for INEL units. It is suspected that the INEL will be in negotiation with EPA for some time on the details of these closure plans and their implementation.

The second set of compliance problems associated with the permitting process is due to Section 3004 (u) of RCRA, which was added by the 1984 Amendments. Under this new provision, EPA has the authority to deny or withhold permits until corrective actions or compliance schedules for same have been accomplished for "all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage, or disposal facility seeking a permit under this subtitle, regardless of the time at which waste was placed in such unit." Simplified, this states that, for a DOE facility pursuing a Part B Permit, the work once to be accomplished under DOE's CERCLA Program (DOE Order 5480.14) will now be regulated and controlled by EPA or a state with primacy. There is ongoing controversy at the Washington, D.C. level about the applicability of Section 3004 (u) to federal facilities. But there appears to be no controversy at the EPA Region level (at least there is no question at Region X) that the section does apply.

This does not mean, however, that the DOE CERCLA Program should be abandoned. The Program lays out a logical, phased approach for gathering the information necessary to evaluate the sites and to accomplish remedial actions as necessary. Whether the work is accomplished under the DOE Program or as negotiated with EPA under RCRA requirements, the basic needs and results should be the same. EPA first requested information pursuant to Section 3004 (u) in the same letter that requested the INEL's Part B permit application. In that letter, the INEL was given one month to complete a checklist entitled, "Information Regarding Potential Releases from Solid Waste Management Units." Available information was submitted at that time, but the remainder will be gathered and provided as part of the Phase I, Installation Assessment required by the DOE CERCLA Program. It is hoped that the procedures and reports specified by the DOE Program will continue to satisfy the requests of EPA. The DOE Program also appears to be the most likely avenue for funding of these actions. On the down side, it appears unlikely that the ten-year completion schedule proposed in the DOE Program will be accept-

able to EPA when they have RCRA authority over the old disposal units. EPA will undoubtedly expect quicker responses, particularly if the units pose a potential for threat to health, safety, or the environment.

The INEL is thus anticipating that all past HW or RMW activity sites will have to be addressed before a Part B Permit is issued by EPA. At sites where there is any potential for release of hazardous substances, remedial activities, closure under RCRA or compliance schedules for this type effort will have to be done. By regulatory mandate, EPA must issue or deny the permit within three years. In order to receive the permit, the INEL must not only prove that the facilities to be permitted will be operated correctly, but must also satisfy EPA with its efforts to amend for past actions.

INCREASED RESTRICTIONS ON LAND DISPOSAL

The 1984 RCRA Amendments to Section 3004 [(c) - "Liquids in Landfills," (d) - "Prohibitions on Land Disposal of Specified Wastes," (e) - "Solvents and Dioxins," and (g) - "Additional Land Disposal Prohibition Determinations"], covering additional restrictions on hazardous waste land disposal that are pertinent to INEL operations are summarized in Table I. This table also provides information on the location of the Amendments within the RCRA regulations, the deadlines set by EPA for enactment or a determination, and the "hammer provisions" [footnotes (a) and (c)] where applicable.

As evidenced by these new regulations, the land disposal of hazardous waste, especially liquids, will eventually be deleted from EPA's list of acceptable TSD options. The Amendments are designed to place more and more restrictions on land disposal, making this option less favorable in terms of economics and liability. EPA's stance is further emphasized by the newly amended Section 1002 (b) that states:

"... to avoid substantial risk to human health and the environment, reliance on land disposal should be minimized or eliminated, and land disposal, particularly landfill and surface impoundment, should be the least favored method for managing hazardous waste."

Consequently, a major goal of the INEL's Long-Range Hazardous Waste Program Plan is to eventually find suitable alternatives to the off-site land-filling of hazardous waste, involving on-site and/or off-site treatment options. The EPA-permitted TSD facility in Utah, currently receiving INEL-generated waste, is performing any needed treatment prior to disposal of these wastes. However, a preliminary step toward eliminating the land disposal of hazardous waste will likely involve a combination of treating all appropriate hazardous waste on site (in the INEL's permitted TSD facilities) and the on-site pre-treatment (e.g., solidification) of the remaining wastes, so that they can be more safely landfilled off site.

Toward this end, an options study will be conducted in the near future to determine the best alternatives, both near and long-term, to off-site land disposal. Implementation of the favored options will not only solve the anticipated problems brought about by the rapidly increasing land disposal restrictions, but will also help establish compliance with the new waste minimization regulations, to be discussed in the last section of this paper.

UNDERGROUND STORAGE TANK REGULATIONS

One of the recently amended portions of the RCRA regulations, which has created an ongoing impact at the INEL, involves the introduction of the totally new Subtitle I - "Regulations of Underground Storage Tanks." The Underground Storage Tank (UST) program, established by these new regulations, defines the types of tanks which may be installed; initiates a tank notification program; requires EPA to issue federal technical standards for all tanks; coordinates federal and state efforts; and provides for federal inspection and enforcement. The sections of Subtitle I pertinent to the INEL Hazardous Waste Program are summarized below:

1. Section 9001 defines: (a) "UST" as any tank with at least 10% of its volume, including any attached pipes, below ground and (b) "regulated substances" as those substances (regulated under Subtitle I, rather than Subtitle C) stored in a UST, including petroleum and CERCLA hazardous chemical products.
2. Section 9002 requires owners to submit notification forms to the designated state or local agencies on all currently used UST's and out-of-service (after January 1, 1974) UST's by May 8, 1986. These forms provide information on age, size, type, location, and uses of tanks.
3. Section 9003 establishes interim minimum-standard requirements for new UST's installed as of May 7, 1985, and sets deadlines for EPA's issuance of final regulations and standards for petroleum and hazardous substance tanks, both existing and new, ranging from 27 to 45 months after the enactment date of November 8, 1984.

The INEL consists of several major facilities operated by six different contractors who are responsible for programs administered by three different DOE operating offices. Most of the facilities have tanks that store substances listed in the UST regulations and that satisfy the definition of "underground storage tanks" as defined in the UST regulations. Some of these facilities, built in the late 1940's and early 1950's, include tanks that were installed during the same period.

The UST requirements have had, and will continue to have, a significant impact on the INEL. The major effects of this impact are both programmatic and economic. To illustrate these effects, the impact must be looked at in two parts--an initial impact, and a continuing impact.

The initial impact is primarily economic and arises from funding the efforts required to establish compliance with two of the previously mentioned UST regulations: (1) Interim standards for new tank installations, and (2) the Notification Requirements for Owners of Underground Storage Tanks, Final Rule (40 CFR Part 280, November 8, 1985). The initial impact is considered economic because, in the case of the requirement for tank installation, it is simply a matter of providing funding to buy tanks that meet the standards specified in the regulations. In the case of notification requirements, it is a matter of providing the funding to cover the research and collection of the necessary data. For a facility the size of the INEL, this is a considerable effort. There are well over 100 tanks at the INEL that require

notification to the state of Idaho. Most of these tanks are used for storage of petroleum products, the rest for storage of radioactive wastes.

The continuing impact is both programmatic and economic. This ongoing impact involves the provision in the RCRA Subtitle I regulations pertaining to the release detection, prevention, and correction regulations. These regulations are still in the development stage within EPA and have not been published yet. The requirements for regulations to be promulgated in this section of Subtitle I indicate that a comprehensive tank management program needs to be developed and organized to examine leak test methodologies, tank testing procedures, tank and piping design standards, tank installation procedures, etc. Risk assessment studies, tank replacement priority studies, studies on retrofitting existing tanks with corrosion protection, training, remedial actions, and liability also need to be addressed. These are only some of the major issues that should be examined, but they indicate a significant programmatic impact. The economic impact is represented by the significant funding requirements necessary to pay for the studies, training, design work, etc., mentioned above.

In summary, the INEL has been, and will continue to be, impacted by the Underground Storage Tanks (UST) regulations. The major areas of impact will require expanded programs and budgets.

SPECIFIC REQUIREMENTS FOR FEDERAL FACILITIES

Mandatory EPA Inspections

Federal facilities in states lacking authorization must now submit to mandatory EPA inspections annually, under the newly amended Section 3007 (c), "Federal Facility Inspections." A thorough inspection of each hazardous waste TSD facility owned or operated by a federal agency is to be conducted by EPA, beginning November 8, 1985. The stated objectives of the inspections are to enforce the facility's compliance with all applicable regulations under Subtitle C of RCRA. Also, the records of such inspections shall be available to the public, except as provided in Section 3007 (b).

The EPA Region 10 office has informed DOE-ID that it will conduct its first RCRA compliance inspection of the INEL in April 1986. In preparation for the upcoming EPA inspection, the services of a non-governmental hazardous waste consulting firm were recently engaged by EG&G to help conduct a "dry run" RCRA compliance audit. [Such unofficial inspections are recommended in Section 3007 (e)(2), which also calls for an EPA report to Congress by May 8, 1985, containing recommendations on provisions and requirements for a program of private inspections to supplement governmental inspections.] All but one of the major INEL operating facilities were audited, and the findings will be used to identify any areas requiring further work before the upcoming EPA inspection.

Inventory of Federal Hazardous Waste Facilities

The RCRA Subtitle C Amendments included the addition of a new Section 3016 (a, b), "Inventory of Federal Agency Hazardous Waste Facilities," which states in part:

"Each Federal agency shall undertake a continuing program to compile, publish, and submit to the Administrator ... an inventory of each site which the Federal agency owns or operates or has owned or operated at

which hazardous waste is stored, treated, or disposed of or has been disposed of at any time."

These inventories are to be submitted biennially to EPA, beginning January 31, 1986. Agencies need not resubmit information already submitted under Section 103 of CERCLA or Sections 3005 and 3010 of RCRA, other than to update any previous submissions to reflect the latest data. EPA must conduct the inventory if federal agencies fail to do so.

The INEL's inventory was recently submitted to DOE-ID for forwarding to EPA by January 31, 1986. The following information was provided and/or updated for all sites within the INEL, owned or operated by DOE, where hazardous waste is currently stored or treated, or where disposal of hazardous waste has occurred at any time: (1) Installation/site location descriptions for any site where hazardous waste TSD occurred prior to the date on which EPA permits were required; (2) current status of each site with regard to the TSD of hazardous waste; (3) amount, nature, and toxicity of hazardous waste handled; (4) nature and extent of known environmental contamination; (5) list of hazardous waste disposal sites lacking environmental monitoring data; (6) list of response actions at contaminated facilities; (7) description of the hydrogeology for hazardous waste disposal sites; and (8) name and address of the responsible federal agency.

WASTE MINIMIZATION

The new 1984 RCRA Amendments dealing with waste minimization affect operations at the INEL in terms of both the hazardous waste generated and the method of TSD selected for these wastes. For example, as of September 1, 1985, Section 3002 (b) states that the manifests required for off-site shipments from the INEL must contain a certification that:

1. The INEL has a program in place to reduce the volume or quantity and toxicity of such waste to the degree determined to be economically practicable; and
2. The proposed method of treatment, storage, or disposal is that method currently available which minimizes the present and future threat to human health and the environment.

The same information must be certified at least annually for INEL-generated hazardous wastes that are handled in on-site TSD facilities. This will be required as a condition of all on-site TSD permits after September 1, 1985, under Section 3005 (h).

Also, the biennial reports submitted by the INEL to the EPA Regional Administrator are now required by Section 3002 (a)(6) to provide the following additional information:

1. A description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated; and
2. A description of the changes in volume and toxicity of waste actually achieved during the year, in comparison to previous years to the extent such information is available for years prior to 1984.

The two programs implemented at the INEL to ensure compliance with these new regulations are discussed in detail below.

Waste Minimization Program

This program includes those activities directed toward reducing the volume or hazard of a material before it becomes a waste. The four basic practices used in the INEL's waste minimization program are: Materials substitution, process changes, waste recycling/recovery, and proper management. After a hazardous waste stream has been identified and characterized, these methods are used to determine whether or not further reductions are possible.

Materials substitution involves the selection of alternate raw materials to replace hazardous materials, which often lead to the generation of hazardous wastes. Therefore, the substitution of less hazardous or nonhazardous alternatives can be an effective means of minimizing waste. This practice has been successfully applied at the INEL. For example, by replacing a chromate-based corrosion inhibitor with a phosphate-based inhibitor in treating process water, this hazardous waste stream was completely eliminated. Another example was the substitution of nonhazardous solvents for the toluene and xylene formerly used for liquid-scintillation counting.

The second method, process changes, utilizes the modification or changing of a process to reduce the volume and/or toxicity of the waste generated. This was successfully employed on the sulfuric acid and sodium hydroxide wastewater streams that were produced during the regeneration of the cation and anion exchange resins used to demineralize process wastes at various INEL facilities. These hazardous wastes were eliminated by employing excess equipment as elementary neutralization units.

Waste recycling/recovery plays a major role in the INEL's waste minimization program. Currently, used oil and spent lead-acid batteries are recycled at off-site facilities. Plans for the future include the development of recycling/recovery capabilities on site for radioactively contaminated lead and silver zeolite. Lead, in significant quantities, is used at the INEL for radiation shielding in various forms (sheeting, bricks, and shot). Some of the lead has become surface-contaminated to the point that it can no longer be safely used as shielding. Recycling will seek to remove the contamination from this lead so that it can be reused on an unrestricted basis or as shielding on a restricted basis.

About 6,000 lb of silver zeolite are used in reactor buildings and hot cell facilities to remove airborne radionuclides, particularly iodine. When the removal efficiency of the zeolite becomes too low, the approximately 30,000 troy oz of silver will be recovered, rather than simply disposed of as radioactive mixed waste. Options studies will be conducted to identify the best method of recycling/recovery for both lead and silver zeolite.

The final method in the INEL's waste minimization program is the implementation of good management practices in all areas dealing with the generation of hazardous waste. This can be a very effective means of minimizing waste and is probably the simplest and least expensive, requiring in many cases only concerted effort. The most important aspect of proper management utilized at the INEL is the segregation of nonhazardous waste from hazardous waste. By avoiding hazardous mixtures, the volume of hazardous waste generated is greatly reduced. Other methods of proper management include: (a) Development of operational procedures and safety documents that directly address

the management of hazardous waste; (b) adequate training for all personnel involved; and (c) implementation of the three previously discussed means of waste minimization whenever feasible.

Program for Selecting the Best TSD Methods

Effective September 1, 1985, generators must certify on every manifest for hazardous waste shipped off site that,

"the proposed method of treatment, storage, or disposal is that practicable method currently available to the generator which minimizes the present and future threat to human health and the environment."

As a result, the choice of TSD method has become the responsibility of the INEL as a generator of hazardous waste. In order to ensure that the best methods of TSD are selected, both on site and off site, a program has been implemented at the INEL that consists of the following steps:

1. Each waste stream generated is first identified and characterized.
2. Next, an options study is conducted that identifies and evaluates all applicable TSD methods for each waste, in terms of end-product quality, cost, and health and safety.
3. The methods recommended by the options study are then incorporated into the INEL's Hazardous Waste Management Program.
4. After implementation, a follow-up review is conducted on the selected options to be certain they are accomplishing their envisioned objectives.

Since there are no suitable facilities in existence, on or off site, for the TSD of radioactive mixed waste (RMW) and extremely reactive waste, they have been given priority with regard to the review process described above. Options studies have recently been completed for these wastes and the implementation of the selected options is underway. These options involve the permitting of a storage facility, an incinerator, and a solidification facility for the RMW and the open burning of reactive wastes that cannot be shipped off site due to safety reasons.

The next phase of this program will be to evaluate the hazardous wastes that are currently being shipped to an off-site disposal facility. The outcome of this evaluation is expected to involve the on-site treatment of some of these wastes in the facilities developed for RMW (and possibly additional facilities) and the continuation of off-site disposal for the remainder. In any case, the prime objective of this program is to see that the best TSD method is selected for all applicable INEL-generated wastes, which will minimize the present and future threat to human health and the environment, as specified in the 1984 RCRA Amendments.

CONCLUSIONS

The sophisticated INEL program for the management of both hazardous and radioactive mixed waste has been greatly influenced during recent years by the implementation of the RCRA regulations. In addition, the 1984 RCRA Amendments have had, and will continue to have, a significant impact on the management of these wastes. Hazardous waste operations have been particularly affected by the Amendments dealing with RCRA Part B permitting, increased restrictions on land disposal, requirements for underground storage tanks, requirements for federal facilities, and waste minimization. Undoubtedly, major efforts in these areas will be required at the INEL in coming years to ensure compliance with these new RCRA regulations.