

THE DEPARTMENT OF ENERGY'S ENVIRONMENTAL RESTORATION PROGRAM

John Lehr
Deputy Director, Northwestern Programs
Office of Environmental Restoration
U. S. Department of Energy

Julie D'Ambrosia
EnviroTech Associates, Inc.

ABSTRACT

The Department of Energy operates a large industrial complex located at various production, processing, testing, and research and development installations across the country. This complex has generated, and continues to generate, significant quantities of radioactive, hazardous, and mixtures of radioactive and hazardous (mixed) wastes that must be managed.

Over the past 40 + years of operation, the waste generated by this complex has been managed to then-current standards. However, some of these waste management practices have subsequently been proven to be inadequate for long-term environmental protection. Therefore, the Department is faced with the task of characterizing and remediating waste sites and facilities contaminated through operation of the complex over the past 40 + years.

The Office of Environmental Restoration is responsible for environmental restoration and decontamination and decommissioning activities associated with 112 sites in 33 states, a site in the south pacific, and one site in Puerto Rico.

This presentation describes the scope of the DOE problems, ranging from managing newly generated wastes to remediating previous disposal or operating facilities which do not meet current environmental standards. It will briefly describe some of the activities at the sites located near Livermore, CA; Hanford, WA; Los Alamos, NM; Rocky Flats, CO; Savannah River, SC; and Oak Ridge, TN. In addition, this presentation will serve as an introduction to specific papers on activities at Hanford, Oak Ridge, Savannah River, and Rocky Flats.

BACKGROUND

The Department's sites are predominantly regulated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), but some of the sites fall under the corrective action requirements of the Resource Conservation and Recovery Act (RCRA). A large number of these facilities began operations over 40 years ago. Waste disposal and contaminant content records are incomplete and are often found to be inadequate under today's requirements. Consequently, the Department does not yet know the full nature or extent of contamination nor the exact number of sites. However, a partial list of contaminants includes: acids and bases, solvents, heavy metals, organics, radioactivity, high explosives, and corrosives. The types of sites include: landfills, burial grounds, waste ponds, surface spills, buried debris, seepage pits and cribs, and the resulting contaminated groundwater and soil.

The funding for the Environmental Restoration program for fiscal year 1992 exceeds \$1.4 billion dollars. For 1993, the President has requested \$1.8 billion for these activities. These budget numbers include the Decontamination and Decommissioning program, the Formerly Utilized Sites Remedial Action Program and the Uranium Mill Tailings Remedial Action Program.

PROGRAM CHALLENGES

The Environmental Restoration program must balance the need to aggressively move forward against the need to spend the taxpayers money wisely. Congress and the public are not likely to continue to support environmental programs if they believe the money is not being spent wisely. Therefore,

the Environmental Restoration Program has developed a multi-faceted near-term approach to remediation consisting of: (1) aggregate area management; (2) expedited responses; and (3) source containment and isolation.

Responsible stewardship of taxpayer dollars demands that the Department get the most from each dollar spent, and that duplication of work or repetitive tasks should be avoided. By recognizing similar contaminant/contaminated media problems, DOE can achieve significant economies by aggregating these problems for the purposes of characterization and assessment. This should result in the need for fewer documents and associated reviews and approvals, fewer decision documents, a reduction in program costs, and savings in time to implement the remediation program.

A key activity in allocating funding and implementing remediations is the identification and execution of expedited responses. Several papers in the session will address specific activities where a problem was identified and an action taken immediately. The Department encourages a rapid response where warranted, as it allows the problem to be addressed before it can become either more widespread or more difficult to remediate. Removal of the source of contamination may be appropriate where a population may be at risk, where a driving force exists which might spread the contamination further, or where a proven technology exists to treat the contaminated material after its removal.

The Department also is focussing on source containment and source isolation as keys to managing the environmental restoration program. Not only is today's technology insufficient to provide for actual "clean up" of many of the sites, but there is often no place to put the waste once it is removed from

the existing contaminated area. Low-technology solutions (such as digging up the waste and trucking it elsewhere) are not really solutions at all--they simply move the contamination from one location to another. In addition, movement of contaminated materials is prohibitively expensive, and poses hazards to today's workers which may well exceed both the short term and long term hazard associated with the contaminants in situ.

To provide a context for the rest of the papers in this session, the following is a listing of major sites, 1992 funding levels, and scope of the problem:

- Albuquerque Field Office - \$148.9 million to address eight installations, which include about 800 sites encompassing over 8.5 million cubic yards of waste on approximately 12500 acres
- Fernald Environmental Management Project - \$211.4 million to address 28 sites encompassing over 900,000 cubic yards with an unknown areal extent
- Idaho - \$66.4 million to address about 300 sites encompassing over 2.4 million cubic yards on over 1,200 acres
- Nevada - \$26.6 million to address 725 sites with an unknown volume and areal extent
- Oak Ridge - \$274.3 million to address: ORNL with 187 sites encompassing an unknown volume and areal extent; and Y-12, with 165 sites including over 840,000 cubic yards on an unknown areal extent
- Richland - \$139.4 million to address 1400 sites encompassing 1.9 billion cubic yards on over 429 acres
- Rocky Flats - \$45.0 million to address 178 sites on approximately 350 acres
- Savannah River - \$49.7 million to address 262 sites encompassing an unknown volume and areal extent

At these sites, there are significant problems with characterizing contamination, and most of these problems are shared by more than one site. For example, there is inevitably a finite period of time (generally in years) between the time of a release and the initiation of a remedial action. The mere size of the DOE sites and the scale of operation can be daunting. Leaks can merge, creating a plume which requires more creative management. Records of previous leaks, and indeed, past management practices, challenges DOE's ability to determine where contamination exists. In some cases, the formerly remote DOE sites are now surrounded by businesses or residences. Given the commingling of plumes, and the mixtures of hazardous chemicals and radioactivity in some of the

leaks, worker safety must be a consideration. And DOE must ensure that intrusive characterization does not pose a risk to the public through releases. But most importantly, there is the concern that public and congressional support for this program will erode as more dollars and time are expended on characterization and its documentation.

DOE has developed objectives for the assessment phase of remediating the environmental restoration sites. For example, DOE is endeavoring to streamline site characterization -- characterize only enough to determine what action may be required, then perform that action. This is called the "observational approach".

Also, the sites must learn from past characterization activities, and benefit from previous experience. The "aggregate area management strategy", being implemented at Hanford is an example of this.

And it is DOE's policy to address the worst sites first. This approach will be improved when the environmental restoration priority system is completed and implemented. However, addressing the worst sites first requires that the risks associated with each site be determined. And with the present uncertainties, this may be impossible. That is why DOE is working with the Agency for Toxic Substances and Disease Registry to assess the risks at each site.

CONCLUSION

DOE's environmental restoration program presents many diverse challenges in the areas of characterization, remediation, and long term management. Because significant site characterization is necessary before remediation needs can be identified, DOE is working to develop new, more cost effective, characterization technologies, and is endeavoring to avoid excessive characterization. DOE recognizes that the lack of appropriate technologies may doom the program to spending more money than justified by the risks posed by specific contamination, and that this lack also has the potential to impact DOE's ability to accomplish the 30-year remediation goal.

However, by taking these approaches and accomplishing the above activities, DOE can present to Congress and to the public the logic of the program, and may be able to maintain the support exhibited to date. But most importantly, by implementing the ideas outlined above, DOE can ensure that the program makes the best use of funding, personnel, and technologies, and the program is accomplished in the most cost-effective, efficient manner.