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NOTICES

DEPARTMENT OF ENERGY

[DOE/EIS-0120]

Waste Management Activities for Groundwater Protection, Savannah River Plant,
Aiken, SC; Record of Decision

Wednesday, March 9, 1988

***7557** The Department of Energy (DOE) prepared this Record of Decision pursuant to Regulations of the Council on Environmental Quality (40 CFR Part 1505) and Implementing Procedures of the [Department of Energy \(52 FR 47662, December 15, 1987\)](#). This Record of Decision is based on DOE's Draft and Final Environmental Impact Statements, Waste Management Activities for Groundwater Protection, Savannah River Plant, Aiken, South Carolina (DOE/EIS-0120), the public scoping meetings and review hearings on the Draft EIS, and the distribution of approximately 850 copies to Congress, state and Federal agencies, and concerned groups and individuals. DOE considered all public and regulatory comments received on the EIS in the preparation of this Record of Decision.

Decision

DOE has decided to modify hazardous, low-level radioactive, and mixed waste management activities at the Savannah River Plant (SRP) by implementing the Combination strategy discussed in DOE/EIS - 0120. Specific project-level actions to be implemented are discussed in the EIS and include:

1. The closure of six inactive low-level radioactive waste sites in the SRP R- Area and one "mixed" waste site in the F-Area where waste constituent concentrations demonstrate a need for removal (even though total waste removal is impossible under any strategy)

These sites were selected for waste removal as a part of the Combination strategy because waste removal now would significantly reduce the extent of or eliminate the need for groundwater remedial actions after site closure. Additional sites may be selected in the future, based on further site-specific investigations and regulatory interactions.

2. The construction of a new "vault-design" low-level radioactive waste disposal facility adjacent to the existing low-level waste burial ground near the center of SRP at site "G"

Currently, the Department of Energy also plans to construct and operate new storage/disposal facilities for hazardous and/or mixed waste in accordance with the Resource Conservation and Recovery Act (RCRA), the Hazardous and Solid Waste Amendments of 1984 (HSWA), and/or the South Carolina Hazardous Waste Management Act (SCHWMA), as amended. The prime candidate sites for the disposal facilities (either a RCRA landfill, an aboveground or below ground vault, or a cement/flyash matrix vault) are at sites "L" and "B" as discussed in the EIS. Storage facilities will be sited, designed, and constructed in these or other areas based on operating considerations and in compliance with regulatory requirements. The site-specific, project-specific actions will be addressed in future planning and in response to regulatory permitting and decisionmaking processes.

***7558** 3. Reactor disassembly-basin purge water discharges to active seepage and containment basins in the C-, K-, and P-Areas at SRP will continue

DOE will continue to evaluate the general applicability of tritiated- water discharge mitigation measures at SRP.

DOE's decision is based on the assessments and analyses in the EIS. Based on these assessments

and analyses, DOE has concluded that implementation of the Combination waste management strategy at SRP will provide adequate environmental and human health protection in accordance with existing requirements.

Background

The Savannah River Plant is a major DOE installation that produces nuclear materials for national defense and research purposes and its operations generate hazardous, radioactive, and mixed (radioactive and hazardous) wastes. Previous acceptable waste disposal practices have included the use of seepage basins for liquids, disposal pits and waste piles for solids, and a burial ground for solid low-level radioactive wastes.

Groundwater contamination of water-table aquifers has occurred at some sites as a result of waste management practices at SRP. Detected contaminants include volatile organic compounds (degreasing solvents), heavy metals (lead, chromium, mercury, and cadmium), radionuclides (tritium, uranium, fission products, and plutonium), and other chemicals (e.g., nitrates); measured levels of waste constituents have exceeded maximum contaminant levels (MCLs) and other regulatory standards or guideline concentrations.

As a result of legislative actions [Pub. L. 98-181; RCRA; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and SCHWMA], their implementing regulations, and DOE Administrative Orders, as well as concerns to protect the environment, many remedial or corrective actions have been started at SRP. These actions include the removal and storage of buried wastes and contaminated soils; the design, construction, and operation of liquid effluent treatment facilities; the use of recovery wells and an air stripper to remove volatile organic compounds from groundwater; the design of a two-stage, rotary kiln incinerator to detoxify hazardous wastes; and waste disposal demonstration programs (e.g., the greater confinement disposal demonstration).

In addition, there are ongoing demonstration programs that affect waste management activities including a "beta-gamma" incinerator, and a box/drum compactor. DOE expects these and other programs to result in improved methods for treatment and disposal of mixed and low-level radioactive wastes or reduction in waste volumes to meet applicable regulations.

The terms "hazardous," "low-level radioactive," and "mixed" (i.e., hazardous and low-level radioactive) are used throughout the EIS as common use terms without specific regard to technical or regulatory definitions unless indicated. DOE does not intend this Record of Decision to be a permit application for existing SRP facilities or a vehicle to resolve the applicability of the requirements of RCRA, HSWA, CERCLA, the Superfund Amendments and Reauthorization Act (SARA), and counterpart State of South Carolina regulations to existing SRP facilities or waste sites. Ongoing regulatory interactions and the expanded SRP groundwater monitoring and characterization program will provide the bases for the application of specific regulations and/or permit requirements to existing facilities and waste sites following the publication of this Record of Decision.

Additional documentation in compliance with [40 CFR 1502.20](#) may be prepared if necessary to implement the project-specific actions discussed in and related to the modification of SRP waste management activities assessed in DOE/EIS-0120.

Description of Alternatives

DOE's proposed action is to modify waste management activities for hazardous, low-level radioactive, and mixed wastes at SRP to protect groundwater, human health, and the environment by implementation of a waste management strategy.

DOE considered Combination, Dedication, Elimination, and No Action waste management strategies for existing waste sites, new disposal facilities, and the discharge of disassembly-basin purge water. Table 1 illustrates the project-level actions which were combined to develop the overall strategies for analysis in the EIS.

As shown in Table 1, each strategy results in different combinations of project-specific actions. The number of waste sites from which waste is removed varies with each strategy. Waste removal subsequently determines the acreage which must be devoted to waste management purposes, affects monitoring costs, security concerns, etc. Similarly, selection of one of the alternative strategies will determine whether new disposal and/or storage facilities are constructed, whether discharges of disassembly-basin purge water to reactor area seepage basins will continue, and the

costs and effects associated with the implementation of each strategy. The Combination strategy selected by DOE combines features of the Dedication and Elimination strategies in terms of project-specific actions.

No Action Strategy

No major onsite environmental benefits are expected from the No Action strategy; however, the offsite environment would be protected as a result of continuing waste management practices such as groundwater cleanup in the A/M- Areas. This strategy would result in the following:
Onsite groundwater impacts.

Table 1.--Alternative Waste Management Strategies Analyzed in the FEIS (DOE/EIS-0120)

Alternative strategy	Facility category	
	Existing waste sites	New disposal facilities
discharge		Disassembly-basin purge water
No action; continue to ensure protection of offsite environment	No waste removal and no remedial or closure actions	No new disposal facilities . Continued discharge to seepage basins.
Compliance through Dedication of existing and new disposal areas	No waste removal; remedial and closure actions as required	Aboveground or belowground disposal ... Continued discharge to seepage basins.
Compliance through Elimination of existing waste sites and storage of wastes	Remove waste at all sites; remedial and closure actions as required	Retrievable storage Direct discharge to onsite streams or evaporation.
Compliance through a Combination of dedication and elimination of waste sites, and both storage and		

disposal of wastes . Remove waste at
 selected sites;
 remedial and
 closure actions
 as required Aboveground
 or
 belowground
 disposal
 and
 retrievable
 storage Continued discharge to
 seepage basins and
 study of other
 mitigation measures.

***7559** Elevated concentrations of tritium, strontium-90, and nitrate in Four Mile Creek
 Potential terrestrial impacts from open pits and basins
 Accidental releases from stored wastes with possible impacts on aquatic and terrestrial ecology and
 socioeconomics
 Continued minor habitat and wetlands impacts
 Occupational exposures and risks of fires, spills, and leaks due to waste transportation and accidents
 Dedication of 300 acres
 Potential future exposures to persons occupying the Savannah River Plant
 The estimated total capital cost to continue current practices is about \$17 million. Total 20-year
 operating costs for the No Action strategy are estimated at about \$86 million. Estimated lifetime
 maintenance and monitoring costs are about \$51 million.

Dedication Strategy

The major environmental benefits predicted to occur from the implementation of the Dedication
 strategy include improvement of onsite groundwater quality from remedial and closure actions at
 existing waste sites; improvement of onsite surface water quality; reduction of potential public
 health effects; and reduction in atmospheric releases. A disadvantage would be the removal of some
 sites from public use through their dedication for waste management purposes; as much as 700
 acres would be affected. Environmental impacts under this strategy could include the following:
 Local and transitory onsite groundwater drawdown effects
 Minor short-term terrestrial impacts due to the use of borrow pits for backfill
 Impacts to wildlife habitat due to land clearing and development
 The dedication of about 400 acres of land to new above and belowground disposal facilities
 The dedication of about 300 acres at existing waste sites
 Accidental and occupational risks
 The total capital cost for implementation of this strategy ranges from about \$281 million to \$788
 million. Total 20-year operating costs range from about \$51 to \$258 million. Estimated costs for
 closure range from about \$19 to \$31 million. Estimated post-closure maintenance and monitoring
 costs range from about \$65 million to \$119 million. The cost ranges are based on the types of
 facilities that would be selected.

Elimination Strategy

The environmental benefits expected from the implementation of the Elimination strategy include
 improvement to onsite groundwater and surface water quality from the removal and closure of all
 existing waste sites and remedial actions, as required; reduction of potential public health effects
 and atmospheric releases (except increased tritium air releases under the evaporation option); and
 no requirement for dedication of sites at the SRP. Disadvantages include higher occupational risks
 than with other strategies and the absence of assurance of the future availability of disposal sites in
 other areas. Environmental impacts that could occur under this strategy include:
 Onsite groundwater drawdown effects (local and transitory)

Added tritium releases to surface streams from direct discharge or increased atmospheric (evaporation) releases

The highest occupational risks of all the strategies during waste removal, closure, and remedial actions

Terrestrial impacts at borrow pits that were greater than those for other strategies

Some loss of habitat (up to 400 acres) due to land clearing and development during the construction of the retrievable storage facilities

The greatest risk of spills, leaks, and fires, and the greatest worker exposures due to waste removal, transportation, treatment, and disposal.

The total capital cost for implementation of this strategy during the 20-year operational period would range between \$2.0 billion and \$4.8 billion. Total 20-year operating costs would range from about \$370 million to \$2.4 billion. Estimated post-closure maintenance and monitoring costs are about \$37 million. The costs for the eventual treatment and disposal of stored waste are not included in these monitoring and maintenance estimates.

Combination Strategy

Major environmental benefits to be derived from implementation of the Combination strategy include secure, retrievable storage and disposal of wastes; improvement to onsite surface water and groundwater from removal of wastes at selected sites, closure of selected waste sites, and remedial actions, as required; reduction of potential public health effects; and reduction of atmospheric releases. The dedication of some sites for waste management purposes would be required. This strategy could cause the following impacts:

Local and transitory groundwater drawdown effects

Some habitat disruption on up to 400 acres of land required by new disposal facilities

Dedication of up to 400 acres of land for new storage/disposal facility(s)

The estimated total capital cost of implementation of the Combination strategy ranges from about \$459 to \$957 million. Total 20-year operating costs range from about \$73 to \$273 million. Closure costs range from about \$37 to \$48 million. Estimated post-closure maintenance and monitoring costs range from \$90 to \$105 million.

Environmentally Preferable Alternative

The Elimination strategy is the "environmentally preferable alternative" when long-term impacts are considered. In the short-term, however, implementation of the Elimination strategy results in increased occupational exposures. The Elimination strategy results in the removal of hazardous, low-level radioactive, and mixed wastes at existing waste sites; retrievable storage for wastes resulting from remedial actions and ongoing operations; and ultimately will result in the elimination of discharges of disassembly-basin purge water to *7560 reactor seepage and containment basins. Actual reductions in health effects associated with reduced environmental concentrations of waste constituents are, however, extremely limited. In some cases, health effects associated with the elimination strategy are actually higher than for other strategies, including the Combination strategy, because of occupational exposures resulting from waste removal actions and the re-suspension of waste particles during waste removal actions.

Basis for Decision

In compliance with the National Environmental Policy Act and its implementing regulations, DOE has analyzed the environmental impacts of the alternatives described in the EIS through extensive impact assessment, modeling, and human health and environmental risk assessment. Comments were received by DOE through the scoping process and as a result of distribution of the Draft EIS. DOE considered and responded to these comments as part of the preparation of the Final EIS. DOE's preferred alternative for modifying waste management activities at SRP is the Combination strategy. The Combination strategy was selected by DOE as the preferred alternative over the environmentally preferable alternative because it provides adequate human health and environmental protection, has lower occupational risk, the cost associated with closure actions and the construction of new retrievable storage facilities is significantly lower, and terrestrial ecological impacts are lower.

Considerations in the Implementation of the Decision

Implementation of the preferred waste management strategy will involve separate but related activities for regulatory compliance, Congressional funding authorization, and designs for new storage and disposal facilities.

Conclusion

DOE has considered all environmental factors, benefits and costs, institutional and programmatic needs, and schedules, and has concluded that it will implement the Combination strategy discussed in DOE/EIS-0120. DOE will continue its interactions with regulatory agencies to ensure that actions implemented in accordance with this Record of Decision comply with applicable regulatory requirements. DOE will proceed with implementation of this waste management strategy subject to the authorization and appropriation of funds by Congress.

Dated: March 2, 1988.

Troy E. Wade II,

Acting Assistant Secretary for Defense Programs.

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