

## FOREWORD

The purpose of this environmental impact statement (EIS) is to analyze the environmental implications of the proposed continuation of a large Federal research and development (R&D) program directed toward the immobilization of the high-level radioactive wastes resulting from chemical separations operations for defense radionuclides production at the DOE Savannah River Plant (SRP) near Aiken, South Carolina. This statement analyzes, in general, the environmental impacts which could result from subsequent implementation on the SRP high-level wastes, of the technology developed during the R&D phase. It does not address the impacts of alternative R&D programs for immobilization. Any specific proposals to actually implement the results of the R&D program will be covered in subsequent project-specific reviews.

A related document, *Alternatives for Long-Term Management of Defense High-Level Radioactive Waste at the Savannah River Plant* (Report ERDA-77-42), issued in May 1977, included a description of the SRP high-level wastes and some 23 alternatives for managing these wastes. However, without an extensive R&D program, the only alternative actually available to DOE is continuation of the present SRP storage of wastes as a mixture of alkaline sludge, salt and liquid in large underground carbon steel tanks. The purpose of the R&D program, therefore, is to create additional options for the management of the SRP wastes, which may also be applicable to the high-level wastes at other DOE sites.

The proposed multi-year R&D program is aimed at developing the technology for removing the wastes from the tanks, concentrating them into a high activity fraction, and immobilizing the radioactive nuclides in a high integrity form for subsequent disposal. The proposed R&D program is sufficiently broad in its initial stages so that the immobilized waste could be made compatible with a variety of disposal techniques, such as in a mined geologic repository or surface engineered storage. Moreover, the R&D program could be modified in later stages, as appropriate, to yield a waste form specifically tailored to the exigencies of the disposal method ultimately selected. Sufficient time is allowed to implement any such changes and to consider system compatibility.

The alternatives to carrying out the proposed immobilization R&D program are to decide to (1) continue tank storage of the wastes, or (2) fund an R&D program for direct disposal of the wastes in bedrock under the Savannah River Plant. The consequences of these alternatives have been analyzed for comparison to the consequences of conducting and implementing the proposed immobilization R&D program.

Because of their advanced stage of development, borosilicate glass monoliths are utilized as the reference waste form in the analyses in this statement. However, these analyses do not imply a decision to actually use this waste form. Rather, since these analyses are carried out using glass properties and characteristics which are believed reasonably attainable with near-term technology, and since another waste form would not be chosen unless it had equal or better processing and product characteristics than assumed herein for borosilicate glass monoliths, the EIS calculations can be considered limiting for any advanced waste form in that they should represent the worst conditions expected. A large R&D program is being conducted on other advanced waste forms at a variety of national laboratories, universities, and industrial plants.

The "Report to the President by the Interagency Review Group on Radioactive Waste Management" (IRG) includes the following recommendations:

The IRG recommends the DOE accelerate its R&D activities oriented toward improving immobilization and waste forms and review its current immobilization programs in the light of the latest views of the scientific and technical community. Since final processing of defense waste has been deferred for three decades the IRG also recommends that remedial action, including immobilization of the waste, should begin as soon as practicable.

Accordingly, the proposed R&D program is aimed at permitting a decision on an SRP immobilization plant in 1982, and the waste forms in 1984.

Comments and suggestions for use in the preparation of this EIS were solicited in a Federal Register Notice (42 FR 27281, May 27, 1977), which announced the intent to prepare this statement and the availability of ERDA-77-42. A draft version of this EIS was issued in July 1978 and comments on the draft were received through June 1979. The substantive points identified in the comments received are summarized in Appendix A and are addressed at the appropriate places in the text of the statement. In addition, each letter and the corresponding DOE response are given in Appendix B. Many of the comments on the draft centered around the programmatic versus project-specific nature of the document, and how it fits into the overall waste management decision process. An expanded discussion of these topics is included in the Summary and Description of Proposed Action sections. A Glossary of Terms and Abbreviations is included as Appendix C.