

## PREFACE

The purpose of this Environmental Impact Statement (EIS) is to provide environmental input into the selection and implementation of cooling water systems for thermal discharges from K- and C-Reactors and from a coal-fired powerhouse in the D-Area at the Savannah River Plant (SRP); the Plant is a major U.S. Department of Energy (DOE) installation for the production of nuclear materials. Implementation of cooling water systems for these facilities is needed for compliance with the State of South Carolina Class B Water Classification Standards and Consent Order (84-4-W), dated January 3, 1984, and amended August 27, 1985, and August 31, 1987, between DOE and the South Carolina Department of Health and Environmental Control (SCDHEC).

K- and C-Reactors, which are operating production reactors, discharge their cooling water directly to Pen Branch and Four Mile Creek, respectively. The onsite coal-fired powerhouse in D-Area discharges cooling water from cooling-system condensers into an excavated canal prior to discharge to Beaver Dam Creek. These facilities have been in operation since their construction in the 1950s.

On January 1, 1984, SCDHEC issued a National Pollutant Discharge Elimination System (NPDES) permit (Number SC0000175) for the Savannah River Plant. In this permit, the cooling water discharge limitations included a temperature limitation in onsite streams (i.e., onsite streams are not to exceed 32.2°C; in addition, the effluent must not raise the temperature of the stream more than 2.8°C above its ambient temperature) rather than in the Savannah River as previously permitted by EPA. To achieve compliance with these limitations, DOE and SCDHEC entered into a Consent Order (84-4-W) on January 3, 1984, that temporarily superseded the temperature requirements in the NPDES permit and identified a process for attaining compliance. Major elements of this process included a DOE agreement to complete a comprehensive study of the thermal effects of major SRP thermal discharges, the submittal of a thermal mitigation study, and the selection and implementation of cooling water systems.

On October 3, 1984, DOE submitted its Thermal Mitigation Study to SCDHEC. This study describes the cooling water systems that could be implemented for K- and C-Reactors and the D-Area coal-fired powerhouse to achieve compliance with Federal and State water quality standards.

A Notice of Intent to prepare this EIS was published in the Federal Register on July 29, 1985 (50 FR 30728). That notice solicited comments and suggestions from interested agencies, organizations, and the general public for consideration in preparing the EIS. The preliminary scope was included in the Notice of Intent.

Comments were received by mail and at the scoping meeting held in Aiken, South Carolina on August 19, 1985. Written comments were received until August 31, 1985.

In response to the Notice of Intent, 12 individuals, organizations, and governmental representatives provided comments to assist in the preparation of this EIS. Appendix H includes the issues raised during the scoping process and cross-references to the appropriate Draft EIS chapter or appendix.

As part of the scoping process, DOE invited interested parties to comment on its preliminary determination of reasonable alternatives to be considered in the environmental impact statement (i.e., once-through and recirculating cooling towers for K- and C-Reactors, and increased pumping to the raw water basin for the D-Area powerhouse). Because DOE received no comments on this preliminary determination, it has identified these, in addition to direct discharge of D-Area cooling water to the Savannah River and "no action" (required by the Council on Environmental Quality for implementing the National Environmental Policy Act), as the reasonable alternatives that it will consider in detail in this environmental impact statement.

On March 28, 1986, DOE began the public distribution of the Draft EIS to all interested individuals, agencies, and groups for review. Also on March 28, 1986, a notice in the Federal Register (51 FR 10652) announced the availability of the Draft EIS and a 45-day review/comment period on the document from March 28 to May 19, 1986. DOE conducted public hearings in Aiken, South Carolina, on April 30, 1986.

During the 45-day comment period, DOE received 27 statements and comment letters on the Draft EIS. DOE also received three comment letters after May 19, 1986.

Many of these comments have led to revisions in this Final EIS. Appendix J contains the comments received during the public comment period and DOE's responses to these comments.

In this Final EIS, changes from the draft are indicated by vertical lines in the margin of each affected page. Minor typographical and editorial corrections are not identified. Changes that are the result of public comments are identified by the specific comment numbers that appear in Appendix J. A change that is the result of an error (typing error, etc.) in the draft is identified with the letters "TE," and one made to clarify or expand on the draft statement is identified with the letters "TC." Those changes in this Final EIS that are the result of a public comment are identified by an alphanumeric marginal notation (e.g., AA-1); these notations refer to comments in Appendix J. The responses to these comments in Appendix J also provide additional information and clarification.

In this Final EIS, Chapters 2 and 4 and Appendixes B, C, D, and G have the most changes. Appendix I has been added to provide a detailed discussion of the feasibility of using cooling water discharges from K- and C-Reactors for agricultural and aquacultural uses, industrial applications, direct power generation, and ethanol production. In addition to these changes, the order in which the alternatives and subsequent actions/impacts for each reactor are presented have been revised (i.e., discussions of K-Reactor alternatives now precede those of C-Reactor) because the construction of an alternative for K-Reactor would precede the construction of a C-Reactor alternative. No change bars are used for the new Appendix I, the preface, the summary, and for the reordering of the K- and C-Reactor alternatives.

Since the completion of the Thermal Mitigation Study and the Draft EIS, further design evaluations and studies have been performed to determine optimal performance parameters and to achieve lower costs. These evaluations and studies have indicated that, in several areas, optimization of performance

and cost savings can be realized in the construction and operation of once-through towers without introducing major changes in the nature or magnitude of the environmental impacts. These areas include the consideration of gravity-feed versus pumped-feed towers, natural-draft versus mechanical-draft towers, and a chemical injection system for either dissipation or neutralization of chlorine biocide versus holding ponds (and their sizing). Similarly, these evaluations and studies have also led to the development of thermal performance criteria that, when incorporated in the final design of a once-through cooling-tower system, would reduce the potential for cold shock (i.e., reduce the difference between ambient stream temperatures and stream temperatures when the cooling water is being discharged) to fish. In addition, substantive information regarding the biological effects of cooling tower operations has been included in Chapter 4 of this Final EIS.

Since the publication of the Draft EIS, the U.S. Fish and Wildlife Service (FWS) has reclassified the American alligator from "endangered" to "threatened due to similarity of appearance" because the species is no longer biologically endangered or threatened throughout its range (52 FR 107: 21059-21064). The "threatened due to similarity of appearance" status ensures against excessive taking of the alligator and continues necessary protection for the American crocodile, a morphologically similar species. References to the American alligator and impacts to it have been deleted from the summary; references have been retained in the other sections, but without mention of its FWS status (see Appendix C for more details on this reclassification).

This EIS was prepared in accordance with the Council on Environmental Quality NEPA regulations (40 CFR 1500-1508) and DOE's NEPA guidelines (45 FR 20694, March 28, 1980 as amended), by DOE and by DOE's contractors under the direction of DOE. Methodologies used and sources of information relied upon for analysis are identified in this EIS. In addition, available results of ongoing studies have been used.

Referenced material in the EIS is available for review in the U.S. Department of Energy's Public Reading Room, located at the University of South Carolina's Aiken Campus, Aiken, South Carolina, and the Freedom of Information Reading Room, Room 1E-190, Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C.