

# A PLANNING PROCESS FOR AN IMPROVED ENVIRONMENT AT THE SAVANNAH RIVER SITE (U)

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## ABSTRACT

The environmental planning process at the Savannah River Site is described. Numerous site departments are involved with environmental matters which requires interaction and coordination in the preparation of planning documents. A process has evolved over the last several years to address the prevention of environmental problems and improve compliance for all environmental media. The culmination of these efforts was the site's Environmental Implementation Plan. Development of this comprehensive site plan began in 1985 and was completed in August 1989.

The plan addresses existing site conditions, objectives, strategies, implementation methods, and resource requirements for specific environmental media (surface water, groundwater, drinking water, land use, waste, air, etc.) and support activities (auditing, compliance tracking, employee education, community awareness, etc.). The plan has been utilized for the preparation of several other documents and reports.

The need for a comprehensive site database was also recognized during the development of the planning process. This database was developed and has been utilized for the preparation of several documents and reports. The database will reduce the need for repeated information requests to site departments.

The planning process gives the site the what, when, how, and why for environmental requirements. Communication with site departments is essential for making the process work. The availability of a comprehensive environmental planning documents and database insures information consistency when other reports are prepared.

## INTRODUCTION

The purpose of this paper is to describe how one of the Department of Energy (DOE) nuclear materials production facilities, the Savannah River Site (SRS), has moved toward the use of an overall planning process to develop programs and attain/maintain compliance with environmental requirements including waste management and environmental restoration. The goal is not just meeting a requirement of developing a five-year plan for waste management and environmental restoration, but using a planning process to address prevention of problems and improve compliance for all environmental media.

### Savannah River Site Description

The SRS produces nuclear materials, primarily tritium and plutonium, for national defense. Constructed in the early 1950's, the installation near Aiken, South Carolina, is owned by the DOE and operated by Westinghouse Savannah River Company (WSRC).

The SRS produces nuclear materials by manufacturing fuel and target components, irradiating the components in nuclear reactors, chemically extracting the desired nuclear materials from the irradiated fuel and targets, separating radioactive waste, and solidifying the radioactive wastes in glass for final offsite geologic disposal (Fig. 1).

The SRS is located in south central South Carolina and occupies an almost circular area of approximately 325 square miles (Fig. 2). The Savannah River forms the south-

western boundary of the plant, which is a controlled area with limited public access. The production facilities occupy less than five percent of the SRS area with the remainder being forested lands or wetlands. Eighteen production, service, and research and development areas are scattered across the site. These include five production reactors (three operational, one in cold standby and one in shutdown status), two chemical separations areas, waste processing facilities, fuel and target fabrication facilities, heavy water rework facility, powerhouses, general facilities, semi-works research facilities, administrative, technical and shops services areas, and U.S. Forest Service (USFS) areas.

The site employs more than 20,000 people of which approximately 97 percent are employed by the WSRC and its subcontractors. The remainder are employed by the DOE, Wackenhut Services Incorporated, Savannah River Ecology Laboratory (SREL, University of Georgia), and the USFS.

Within the WSRC, environmental protection and regulatory compliance are line organization responsibilities. Each department is responsible for the facilities it operates and has an environmental coordinator that oversees facility compliance activities.

### Savannah River Site Environmental Planning

The development of the Environmental Implementation Plan began with a request in 1985-86 by DOE-Headquarters (DOE-HQ) to develop an environmental plan. DOE-Savannah River-Environmental Division requested

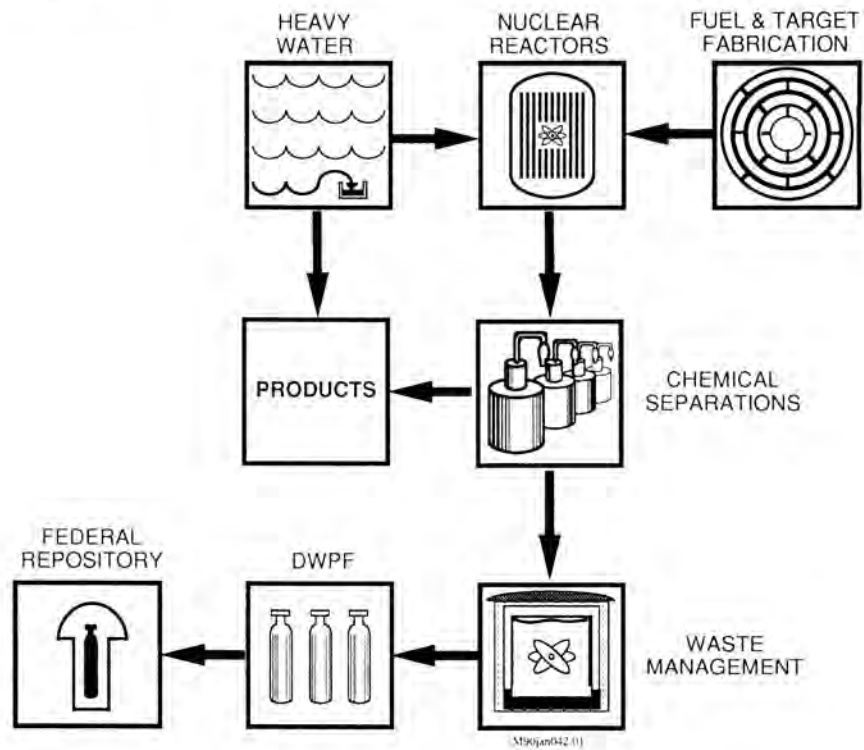


Fig. 1. The Nuclear Fuel Cycle at the Savannah River Site.

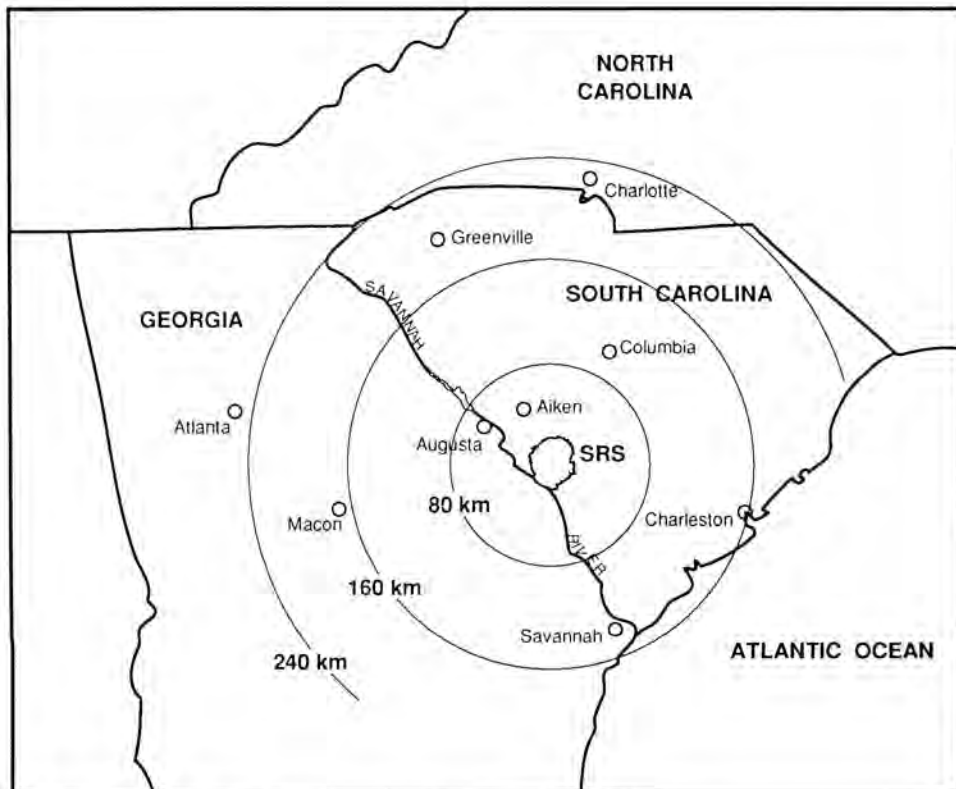


Fig. 2. Location of the Savannah River Site.

that the contractor, then E.I. Du Pont de Nemours, begin development of an environmental plan. The first effort was the issuance of the Strategic Environmental Plan in 1986 which is a description of the philosophy, policy and overall direction of environmental programs for the operations of SRS. Shortly after the Strategic Plan was issued, work began on the Environmental Implementation Plan. The Environmental Implementation Plan was to be a detailed description of the objectives, strategies, requirements, programs, research projects and resource requirements needed to attain and maintain environmental compliance. A great deal of consideration was given to the organization and format of the plan. Numerous meetings were held with departmental managers and environmental staff to discuss objectives, strategies, and how to format the information that was important to contain in a plan. A preliminary draft was issued in late 1986. Shortly after the draft was issued, it was determined that the format needed to be changed. Work continued through 1987 both on content and format.

Another draft was issued in April 1988. This time the draft Environmental Implementation Plan was well organized and contained the necessary detail for documenting the site's environmental plans. It was proposed that the Environmental Implementation Plan would be issued in final, and it would be updated annually. Work began on the updating process in late 1988, and the Environmental Implementation Plan was issued in final form in August 1989. As part of the final issuance process, each departmental manager involved was required to approve of its release.

The Environmental Implementation Plan, as currently formatted, is divided into three volumes: an Executive Summary (Volume I), Protection Programs (Volume II), and Management and Support Programs (Volume III) (Fig. 3).

Major chapters of Volumes II and III are:

#### **Volume II-Protection Programs**

- Introduction
- Site Description
- Surface Waters and Wetlands Protection
- Safe Drinking Water and Other Compliance Programs (National Environmental Policy Act, Toxic Substances Control Act, and Federal Insecticide, Fungicide and Rodenticide Act)
- Land Use and Wildlife Protection Program
- Groundwater Protection and Waste Management
- Atmospheric Protection Program
- Decontamination and Decommissioning Program

#### **Volume III-Management and Support Programs**

- Environmental Auditing and Appraisal
- Employee Education

- Community Outreach and Emergency Planning
- Environmental Compliance Tracking and Data Management
- Resource Requirements

**Each chapter is further divided into:**

- an overview section
- policy statement and background
- description of existing conditions
- objectives
- a strategy depicted in a flow diagram
- an implementation section, further divided by major programs with an overview section; justification/regulatory requirements statement; organizational responsibilities summary; a description of programs, projects or research/studies, and monitoring
- resource requirements
- references
- attachments, which includes, e.g. lists of outfalls, permits, etc.

The Environmental Implementation Plan was issued with a controlled distribution list to easily allow for the incorporation of future changes.

During the updating of the Environmental Implementation Plan, thought was given to the updating process and how to systematize it. A great deal of consideration was given to involvement of more people from the various departments, the timing of the annual update, and the sequencing with respect to the budget process in order to utilize the most recent budget information.

After work had begun on updating and finalizing the document, the request to develop the Waste Management and Environmental Restoration Five-Year Plan was issued to field organizations by DOE-HQ. This entailed developing the input for the Five-Year Plan, comparing it with what was contained in the waste management and environmental restoration sections of the Environmental Implementation Plan, and making adjustments to the Environmental Implementation Plan. While developing input for the Five-Year Plan interrupted the activity of structuring the planning process, it served to emphasize an even greater need to go forward with development of the process and putting it into place. It focused a need for better time sequencing in order to coincide with annual budget submissions, the need for a common database for projects as well as other site activities, and the need for broadbased acceptance of planning.

There are several major differences between the Environmental Implementation Plan and Five-Year Plan. The

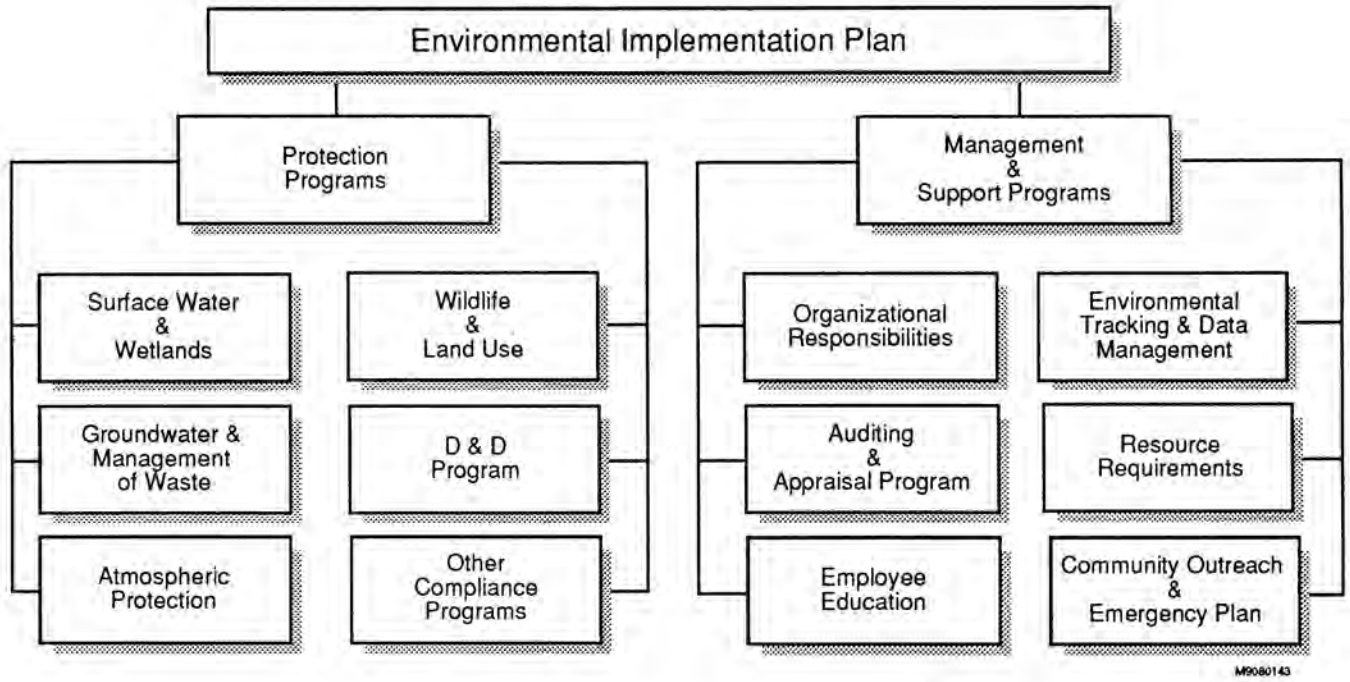


Fig. 3. Structure of the Environmental Implementation Plan.

Five-Year Plan includes specific tasks for environmental restoration, waste management, research and development, and corrective activities for solid, liquid and atmospheric non-compliances. The Environmental Implementation Plan includes these activities as well as tasks identified to maintain facility compliance and provide support for environmental compliance. Support tasks include costs for routine environmental tasks such as permitting, monitoring, analyses, etc.

"Institutionalizing", i.e. having a well-developed and accepted process for environmental planning, gives management and staff continuity and consistency in handling environmental issues/concerns; it moves a facility away from responding to crises. Through that process, a roadmap is developed for what, how, when, and why the facility attains and maintains compliance with the numerous environmental requirements. Having a separate environmental planning process highlights management and staff concerns for the environment and environmental compliance. The contractor, as implementer, must know what the requirements are, and how and when they can be achieved. It is information that the DOE and the regulators must know also. Best of all, a well-developed planning process, involving a number of people and organizations within the operating contractor develops ownership.

The present SRS process is as follows (Fig. 4): the Environmental Protection Section (EPS) Planning Group

distributes data requests to the field followed by meetings with site environmental coordinators and budget personnel. Comments and completed data sheets are returned to the EPS for review, editing, and entry into the sitewide environmental planning database. Data sheets are used to update sections of the Environmental Implementation Plan, including a review of environmental goals, objectives, and strategies.

EPS first holds meetings early in the fall with environmental coordinators for each department to obtain their input on updating the Environmental Implementation Plan. The site environmental coordinators are then responsible for obtaining overall departmental input into revising the objectives and strategies, and to stimulate ideas for projects. It is important to note that incorporating changes based on experiences, findings from audits, and research findings are stressed here as much as a quick fix to a problem. Then the environmental coordinators return the data sheets to the EPS. EPS planning personnel sift through the input they receive plus specific project input from the Budget and Projects Sections of each department. A review of program/projects and corresponding budgets coincides during the development of the budget. That input is factored into re-writing the sections of the Environmental Implementation Plan by EPS with subsequent reviews by the environmental coordinators and any other individuals they may wish to have review the document. Progress on projects and compliance is included in the update. The final draft docu-

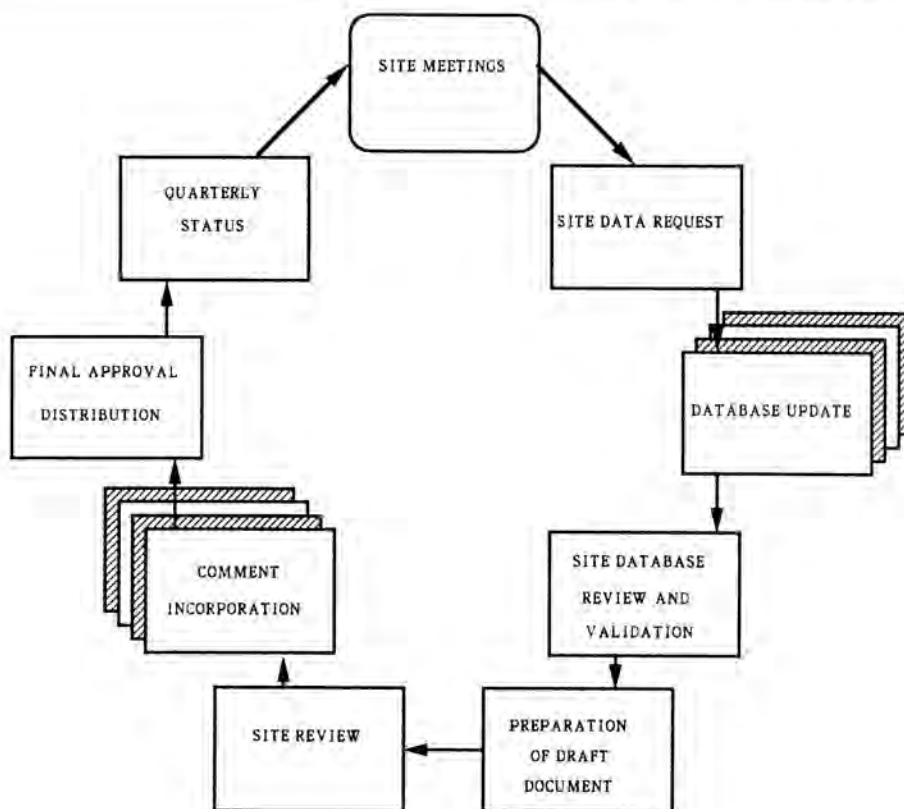


Fig. 4. Savannah River Site Planning Process.

ment is issued and requires departmental management approval prior to issuing the Environmental Implementation Plan in final.

Having a finalized Environmental Implementation Plan enabled the site to respond in a timely fashion to DOE-HQ's request for a Site Specific Plan which was prepared in the Fall, 1989. The Site Specific Plan's purpose was to describe how the site planned to implement Five-Year Plan activities. Major sections of the Waste Management and Environmental Restoration portions of the Site Specific Plan were prepared from the finalized Environmental Implementation Plan. The Site Specific Plan will also be revised on an annual basis; this will coincide with the annual update to the Environmental Implementation Plan.

Important to this process is the use of a common database of environmental tasks or activities. A format was developed to include information that could be used in the development of the budget, the Five-Year Plan, Site Specific Plan, Environmental Implementation Plan, and Office of Management and Budget's Circular A-106 Report (Fig. 5). When projects or programs are developed in the departments, they are input into this format for transmittal (electronically) to EPS. The format for the database has been distributed to all departments, training has been provided in the use of it, and EPS staff have met with 18 organizations on the database to discuss it and answer

questions. The database is now being used in the development of the FY91 and FY92 budget, and the subsequent updates to the Five-Year Plan, Site Specific Plan, A-106 Report, and Environmental Implementation Plan.

As SRS works its way through this process, there are a few new twists that are being examined. First, is the public involvement aspect that is required in the development of the next update of the Five-Year Plan. EPS is working through that process with the Site Specific Plan. The initial Site Specific Plan was submitted for comments to a limited number of external groups including the Environmental Protection Agency, South Carolina Department of Health and Environmental Control, Georgia Department of Natural Resources, South Carolina Governor's office, and local elected officials. The plan will be subject to public review, via public notice, during the first quarter of 1990. A larger number of external organizations will be involved with the review of the second Site Specific Plan which will occur during Spring, 1990. Second, EPS is working on ways to track the implementation of our plans. We need to improve the way in which we know what we did versus what we said we were going to do. One mechanism for communicating this information is through an accomplishments section in the Environmental Implementation Plan. We anticipate that quarterly reporting of accomplishments will be instituted in FY90.

SAVANNAH RIVER SITE ENVIRONMENTAL PLANNING DATABASE

Activity Title

SR Project Number  ID Number  Version No.  Version Date

Installation

Fund Type  B R Code New  FY91 B R Code  Fiscal Yr  Date Created  Last Update

Area  Department  Building  Total Estimated Cost  Project Status

Project Contact  Contact Phone

Activity Title

SR Project Number  A-106 Number

Dept Priority  Priority  LI:GPP Number

EIP Section Number  EIP Subsection No.  Media

Reg Req 1  Reg Req 2  Reg Req 3  Reg Req 4  Reg Req 5

MANYEARS	FY89	FY90	FY90	FY91	FY91	FY92	FY92	FY93	FY94	FY95	FY96
	ACTUAL	TARGET	REQ	TARGET	REQ	TARGET	REQ				
HOURLY	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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MANPOWER (\$1000'S)											
HRLY WKLY	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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OPERATING BASE (\$1000'S)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
PROGRAM/PROJECT (\$1000'S)											
OP	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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GRAND TOTAL	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

DESCRIPTION/JUSTIFICATION:

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ALTERNATIVES:

IMPACT OF NOT FUNDING:

COST BASIS:

LEVEL OF CONFIDENCE:

Fig. 5. Environmental Planning Database Data Sheet.

**Resource Requirements Summary**

The initial Environmental Implementation Plan covered the planning year Fiscal Year 1989 through Fiscal Year 1993. Figure 6 depicts the percentage of total Environmental Implementation Plan Program costs by all issues for FY89 through FY93.

Resource Requirements over this time period were identified as follows:

The funding requirements (manpower, operating, capital, general plant project, and line item) for the Savannah River Site (SRS) environmental program are estimated at \$2.7 billion. This includes over 4155 man-years of effort. The average annual cost is over \$530 million.

Nearly 33 percent of the \$2.7 billion will be incurred by the Waste Management Department. Total Waste Management Department costs will be approximately \$872 million. The Defense Waste Processing Facility (DWPF) accounts for \$720 million or 27 percent of the total five-year cost. The Reactors Department costs rank third at eight percent, or \$213 million, of which \$127 million is targeted for a K Reactor cooling tower. Total Savannah River Laboratory (SRL) costs are \$339 million or almost 13 percent of the total.

The Groundwater Protection and Waste Management Program is expected to require the largest amount of

resources. The program, which includes solid waste disposal and waste site closures, is expected to cost \$2 billion or nearly 76 percent of the total \$127 million for a K Reactor cooling tower. The Atmospheric Protection Program is expected to cost \$12 million over five years.

The operating budget, excluding manpower, is expected to increase over 26 percent from \$268 million in FY89 to \$361 million in FY93. The increase is due to increased waste management and waste site closure activities during the period.

The five-year capital costs are expected to be \$800 million. The Surface Waters and Wetlands program needs are \$244 million. These funds will be used primarily for the construction of K Reactor cooling tower and effluent treatment facilities. The Groundwater Protection and Waste Management Program will require \$424 million. Most of this will be needed for waste disposal facilities such as the Consolidated Incineration Facility and the Hazardous Waste/Mixed Waste Disposal Facility.

**CONCLUSIONS**

In summary, use of a planning process to develop an overall environmental plan, of which waste management and environmental restoration are a part, gives a facility a "roadmap" of what, when, how, and why environmental requirements can and will be met. Through use of those

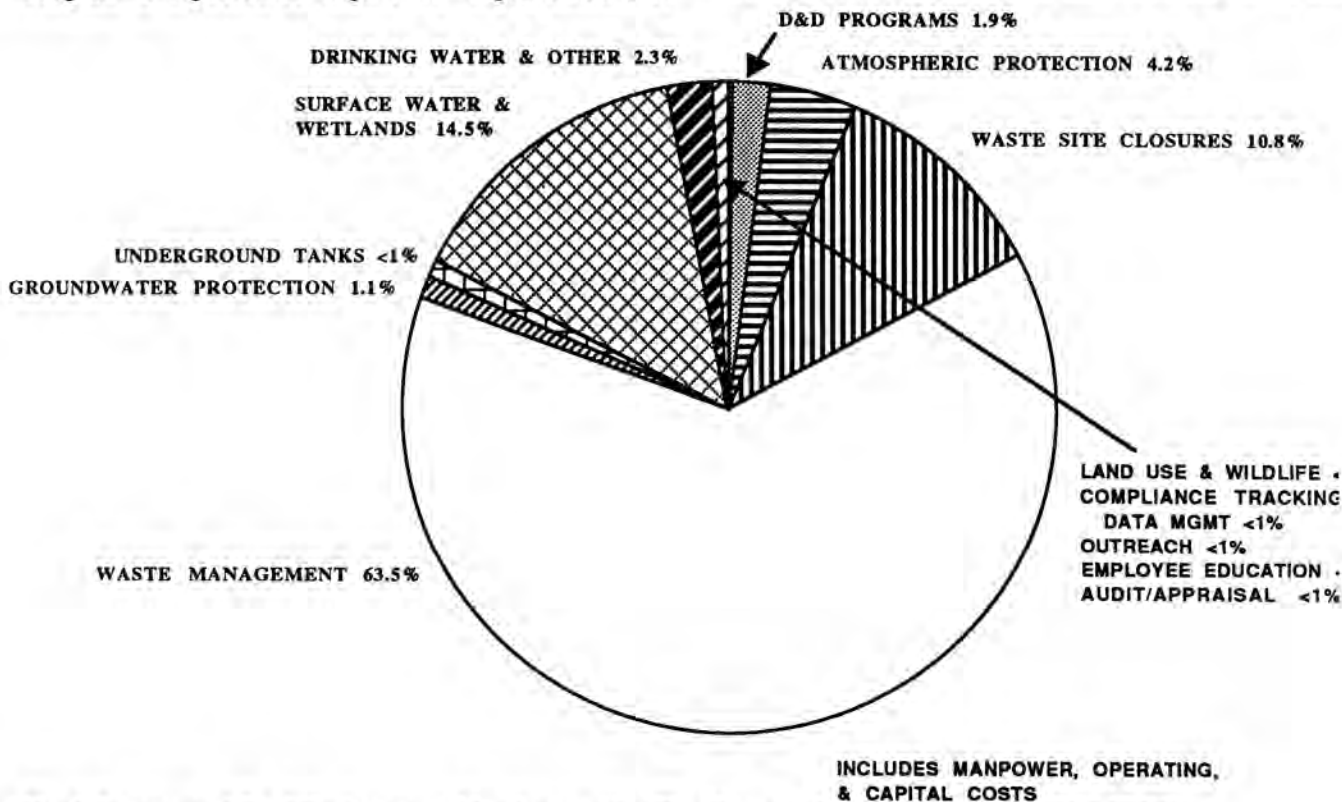


Fig. 6. Summary of Total Environmental Implementation Plan Program Costs by All Issues (FY89-FY93).

organizations actually performing the work to assist in development of the plan, an ongoing commitment to improved environmental compliance and environmental management of resources is developed. Constant contact and follow-up with site environmental coordinators is important to obtain responses to data requests. Overall we are striving for a sitewide database that will cut down on the number of information requests that must be made to environmental coordinators over the course of a fiscal year. The development of a comprehensive Environmental Implementation Plan and site database ensures document and

data consistency. This has been demonstrated with the preparation of other reports (eg. Site Specific Plan, A-106 Report) which were prepared with information from the database and Environmental Implementation Plan.

#### **ACKNOWLEDGEMENT**

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