

VI. RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Continued waste management operations according to present ERDA policies and standards will protect the offsite environment but will contaminate a small fraction of the onsite environment for the long term. Additional onsite areas of contamination will be small compared to those well-defined areas that are already contaminated from past waste management operations. Waste management operations to date have resulted in the establishment of certain areas on the SRP site for continued use in waste disposal or storage. Existing areas that are part of or affected by the waste handling and storage systems include:

- The two tank farms for controlled storage of high-level liquid wastes.
- The burial ground for controlled storage of radioactive solid wastes.
- The seepage basins and associated soil columns in the various areas for disposal of low-level liquid wastes and chemicals.
- Process stacks and sand filters for removal of suspended particulate matter from effluent ventilation air and safe dispersion of gaseous waste products.
- Process piping for transporting liquid effluents.
- Streambeds, flood plains of streams, and portions of the Savannah River Swamp that receive process liquid effluents and surface runoff.
- Sewage treatment plants, septic tanks, and lagoons.
- Sanitary landfill for nonradioactive solid wastes.

Continuation of present waste management plans and policies will result in only the following additional land area being set aside:

- Additional underground storage tanks, pipelines, and evaporators for high-level liquid wastes in the two existing tank farms.

- Additional area for the storage of radioactive solid wastes in the existing burial ground.
- Additional area for the disposal of nonradioactive solid wastes in the sanitary landfill.
- Possible additional seepage basins, retention basins, and ash basins.
- Additional areas for facilities for decontamination, maintenance, waste compaction, or incineration.

These areas are necessary to provide the maximum practical protection of the population from waste materials generated at SRP. They will remain in use as long as plant production operations continue, and will remain contaminated for the foreseeable future even after production operations cease. Most of the plantsite and all of the surrounding land, and adjacent water and air are available for possible long-term uses because the waste handling and storage sites are few in number and are centrally located. The stream beds and the contaminated swamp areas themselves could probably be reclaimed for other long-term uses. However, as long as the present modes of storage of high-level liquid and solid wastes exist, Upper Three Runs, Four Mile Creek, and portions of the swamp are subject to additional contamination in the unlikely event of a severe accident. Criteria for long-term storage of solidified high-level wastes will require that the hazard of stream contamination be minimized.

The waste tanks at F and H Areas, occupying a total area of about 30 acres, and the burial ground between F and H, occupying 195 acres, contain most of the radioactive waste material on the SRP site. The amount of land surrounding those facilities that would be required to ensure isolation of radioactivity in the future is the subject of continuing study. Because movement of material in the ground requires water flow, the required areas will depend in part on hydrology; detailed study of this subject is partially completed. Eventual decommissioning of waste tanks and other facilities will also be part of the long-range waste management program.

Activity in seepage basins on the SRP site is discussed in detail in Section III of this statement and in DP-1349.¹ Most of the activity in seepage basins is at R Area, as described in Appendix A, Table 6, Part 2, where 2700 curies of gross beta activity from one specific incident went to six basins, five of which were subsequently filled with earth. The remaining 25 basins at SRP occupy a total of about 30 acres; most of the radioactivity discarded to basins from routine operation is at F and H Areas in a total area of 20 acres. The major long-lived activity totals released to the F and H basins is: ¹³⁷Cs, 320 Ci; ⁹⁰Sr, 75 Ci; and Pu, about 11 Ci. Other basins on the site, occupying 10 acres, contain: ⁶⁰Co, 10 Ci; ¹³⁷Cs, 35 Ci; and ⁹⁰Sr, 14 Ci.

Contamination in soil within the fenced production areas or adjacent to those areas is tabulated in Appendix A, p. A-13 and pp. A-86 to A-97. Many of these areas could be released in the future if potential use of the land justifies the cost of soil and vegetation sampling and analysis and possible soil treatment.

Long-lived activity, principally ^{137}Cs , is found in stream-beds and flood plains of Steel Creek, Pen Branch, Four Mile Creek, Lower Three Runs Creek and in the bottom sediment of the Par Pond system. The 13,500 acres on the SRP site not now available for timber cutting because of potential radioactive contamination include: stream flood plains, 4700 acres; swamp, 5800 acres; and drainage areas to Par Pond, 3000 acres. The cesium content at these locations is decreasing by radioactive decay and the amounts released to them from production areas have been greatly reduced in the past 15 years. Studies by the Savannah River Ecology Laboratory and Emory University are aimed at determining the behavior of cesium in the flora and fauna of these stream systems. These studies will permit better definition as to when these stream systems could be used without restrictions.

Similarly contaminated land offsite in the Creek Plantation Swamp has been studied in detail as described in Reference 2. Measurements in 43 acres of the swamp were made on 10-ft centers for a total of over 18,000 radiation measurements. Radiation was not uniform; it ranged from background to about 800 mR per year. Radiation exceeded 500 mR per year in 6.6 of the 42.9 acres. As a result of that detailed survey, and an analysis of possible occupancy of the swamp, it was concluded that "no restrictions on use of the swamp are considered warranted, nor are remedial actions needed."³

Much of the land on the SRP site is being put to productive use by the U. S. Forest Service, and most of the site is available and is being used for environmental studies that will better define the effects of current operations on long-term productivity of the environment. In 1972, SRP was declared the Nation's first National Environmental Research Park. The site is now used with very few restrictions based on radioactivity. Timber can be cut by outside contractors for paper and lumber production on all but about 7% of the total Plant area of 200,000 acres. The average ^{137}Cs content of flesh from deer killed in the SRP public hunts has been no higher than that from deer killed elsewhere in the South Carolina Coastal Plains (Table III-4 in Section III). The SRP deer had free access to all of the site except the fenced production areas. All of the land onsite with the possible exception of the waste handling and storage facilities, certain stream beds, and the production areas could be reclaimed in the future for other uses, such as agriculture or tree farming. Restoration of these excepted areas to their pre-plant condition may not be practical, considering both technical and economic aspects.

REFERENCE

1. W. R. Jacobsen, W. L. Marter, D. A. Orth, and C. P. Ross. *Control and Treatment of Radioactive Liquid Waste Effluents at the Savannah River Plant*. USAEC Report DP-1349, E. I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, SC (1974).
2. W. L. Marter. *Radioactivity from SRP Operations in a Downstream Savannah River Swamp*. USAEC Report DP-1370, E. I. du Pont de Nemours and Co., Savannah River Laboratory, Aiken, SC (1974).
3. W. L. Marter. *Gamma Exposure Rates in the Steel Creek and Little Hell Landing Areas*. USAEC Report DPST-74-551, E. I. du Pont de Nemours and Co., Savannah River Laboratory, Aiken, SC (December 1974).