SRS Citizen's Advisory Board

VISION
FUTURE LAND USE - SAVANNAH RIVER SITE

January 23, 1996

This Vision document has been a working paper of the Risk Management and Future Use Subcommittee of the Savannah River Site Citizens Advisory Board throughout the discussions on future use in 1995. It formed the basis for the Citizens Advisory Board Recommendation Number 8 which was approved by the Citizens Advisory Board on September 26, 1995. Minor changes have been made in this document to make it consistent with modifications made during Citizens Advisory Board discussion on this recommendation prior to its approval. This version of the Vision document (dated January 23, 1996) is the final version and supersedes all previous drafts. This version of the Vision was approved by the Citizens Advisory Board on January 23, 1996.

VISION

The Savannah River Site Citizens Advisory Board Risk Management and Future Use Subcommittee have the following vision for the site:

The Savannah River Site will remain intact, under federal ownership and will become a 21st century role model of the mutually supportive coexistence of advanced industrial and commercial developments, futuristic nuclear enterprises, and an environmental research park. The public will become more knowledgeable on nuclear, industrial, and environmental issues as a result of educational and recreational opportunities at the Savannah River Site which are integrated with the continuing wildlife and natural resources management programs. Privatization of some of the Savannah River Site government-owned facilities will be successfully accomplished through leasing facilities. All stakeholders will work cooperatively to further improve the site. The Savannah River Site will become a vibrant part of the economic health of the Central Savannah River Area.

TRANSFORMATION FROM 1995 TO 2025

The transformation will take place by identification and active pursuit of new governmental missions and private industrial and commercial ventures for the Savannah River Site. Below are two lists of suggestions of possible industrial uses of the site to be considered in future plans for the site, one for possible nuclear uses and one for non-nuclear uses. These are merely lists of possible missions gathered from several sources; the Citizens Advisory Board may not have endorsed any particular mission.

Possible Nuclear Missions (Defense And Commercial)

- Construction and operation of a tritium production and/or processing facility (or facilities) (for example, multi-purpose reactor or accelerator)

- Construction and operation of a prototype fusion power reactor (International Thermonuclear Experimental Reactor)
- Development and operation of a medical radioisotope production facility
- Purification and/or fabrication of plutonium-238 for thermo-electric generators
- Development of a nuclear power park (for example, multiple reactors producing power for commercial purposes)
- Stabilization, dilution, temporary storage, and preparation for disposal of fissile materials
- Demonstration of advanced nuclear power systems
- Demonstration of mixed waste destruction, stabilization, and disposal
- Development of a contaminated metal cleaning and recycle facility
- Development and demonstration of commercial uses for depleted uranium
- Others as identified

Possible Non-Nuclear Missions

- Construction of electro-mechanical facilities (robots, electric cars, decontamination equipment, et cetera)
- Development of hydrogen economy facilities (generation, pumping, separation, storage, hydrogen fueled vehicles, et cetera)
- Development of aluminum and aluminum-alloy parts manufacturing
- Development of additional methods for destruction, stabilization, and disposal of hazardous and sanitary wastes
- Development of fiber manufacture for textiles
- Performance of chemical analyses of environmental samples
- Development and field demonstration of alternative energy production methods (other than coal, oil, gas, hydroelectric or reactor-nuclear) to gain more independence from foreign oil
- Others as identified

In addition to the possible future industrial missions listed above, there are a variety of other missions that can build upon current activities. These possibilities include:

- Development of recreation facilities (hiking, biking, and horseback riding trails; picnic shelters; sanitary and drinking water facilities; boating facilities at Par Pond, et cetera)
- Construction and operation of a visitor and education center, possibly making use of a decommissioned nuclear production reactor
- Enhanced biodiversity and ecological research
- Enhanced controlled hunting (turkey, dove, quail, et cetera); sports fishing opportunities might be developed subject to appropriate restrictions to protect the public

BACKGROUND

This Vision reflects the goals for Savannah River Site land uses to satisfy the needs of the nation and the surrounding communities as established by the Citizens Advisory Board. Key participants in development and support of the future of Savannah River Site lands and facilities are the local communities, concerned state agencies, the Savannah River Operations Office of

the Department of Energy , the Savannah River Site Management and Operating Contractor, the Savannah River Ecology Laboratory, the U. S. Forest Service, and other internal stakeholders. The Savannah River Site internal stakeholders have prepared a draft report which is consistent with the direction of this Vision document. In addition, much input was received from various external stakeholders. The majority of external stakeholder input from the Savannah River Site future use meetings conducted by Savannah River Operations Office of the Department of Energy in late 1994 and 1995 have been included in this document. (See the *Draft Savannah River Site Future Use Project Report*, a Department of Energy report issued in October.) Essential to the implementation of this *Vision* is effective land use planning for the location, integration, and utilization of new facilities with the infrastructure, existing facilities, environmental attributes, and cleanup goals in a cost-effective manner.

Savannah River Site is the United States leader in tritium technology, handling, processing, storing, and recycling and the national leader in high-level waste processing and encapsulation in glass. The site maintains a skilled and highly trained staff with expertise to handle major new missions for the nation. The site has many existing facilities (for example, metal fabrication, radionuclide and hazardous chemical analysis laboratories, heat transfer laboratories, metallurgical facilities, et cetera) that could be reconfigured for commercial enterprises. With its large infrastructure of roads, railroads, steam, sewer, cooling water, drinking water, phone system, et cetera, the site could support a new expanded industrial base.

The current waste management, tritium recycling, decommissioning, decontamination, and environmental remediation missions shall continue as well as the wildlife and natural resources management and environmental research programs. With diverse activities and fewer classified activities at Savannah River Site in the future, security arrangements may need to be reconfigured.

The 310-square miles of Savannah River Site should be zoned for land use planning and control, and such zoning should provide the basis for environmental remediation goals associated with the Federal Facility Agreement. Land use categories are defined by the Comprehensive Environmental Restoration, Compensation and Liability Act or Superfund. (See Appendix 1.) For the Savannah River Site land use planning, the following categories are appropriate:

Citizens Advisory Board Land Uses	**Citizens Advisory Board Definition**	**Comprehensive Environmental Restoration, Compensation and Liability Act Cleanup Standards**
Industrial - Nuclear Industrial - Non-Nuclear	Areas of current and possible industrial development	Industrial
Forest and Wildlife Management Recreational Ecological Preserves	Environmental Protection: Areas to be left in natural state (with no industrial development), but can be used for multiple, concurrent uses.	Recreational with restrictions as described in sub-part 8 of Citizens Advisory Board Recommendation 8.

Education and research		

It is recognized that the industrial area, as shown on the map as part of the Citizens Advisory Board Recommendation Number 8, includes Carolina bays, threatened/endangered species, plant habitats, archaeological sites, et cetera As part of siting a new activity within the industrial zone, the required environmental reviews should consider and protect these areas. [Environmental reviews include National Environmental Policy Act, Clean Water Act, Clean Air Act, Endangered Species Act, wetlands protection, Resource Conservation and Recovery Act, et cetera]

RECOMMENDATION

To achieve the vision by 2025, the Savannah River Site Citizens Advisory Board makes the following nine-part recommendation for land use and cleanup goals. This recommendation was unanimously approved as Citizens Advisory Board Recommendation Number 8 on September 26, 1995.

1. *Savannah River Site boundaries shall remain unchanged and the land shall remain under the ownership of the federal government; national security shall not be compromised. Private use of the land will be implemented by lease agreement.*
   - Unforeseen national needs may occur
   - Fair market value of the land is less than estimated cost of remediation
2. *Multiple uses (excluding residential) shall be considered for individual Savannah River Site zones. Land use planning shall be directed toward subdivision of the site into nuclear (defense and commercial), non nuclear, and environmentally protected sectors. Industrial development may only be located in industrial zones.*
   - Currently many land areas have several non-conflicting uses
   - Small areas can be dedicated to specific use
   - Examples of concurrent multiple uses include remediation research, ecological research, recreational, ecological preserves, and education and research areas
3. *Residential uses of Savannah River Site are to be prohibited.*
   - Liability concerns and public perceptions of risk would make it difficult to market Savannah River Site land
   - Residential development is not consistent with meeting the goals of unforeseen national needs
4. *Future use planning shall consider the full range of worker, public, and environmental risks, benefits, and costs.*
   - Risks, costs, and resulting benefits must be studied before decisions are made
   - Risks inherent in remediation must be considered (Example: transportation)
   - Public wants to see appreciable benefits and risk reduction for costs of remediation
   - Studies of human and ecological health must continue
5. *Commercial industrialization of industrial areas (about 1/3 of the land) shall be actively pursued. Within industrial zones the land is available for multiple use and non-*

conflicting multiple uses may continue after a site is industrialized.

- To ensure viability of local region, additional industrialization is needed
- Opportunity to demonstrate how well industry can be integrated with environmental park
- Future industrial siting should consider use of adjacent land and incorporate appropriate buffer
- Industrial development should be encouraged
- Industrial sites include industrial uses and groundwater plumes and 1000-foot buffer
- Industrial cleanup standards should be applied to industrial areas
- Areas of contamination can provide opportunities for field testing of new cleanup technologies
- Opportunities for public education on industrial/ecological interactions should be expanded
- Land use controls and security systems are important to researchers
- Savannah River Site should continue a strong technology transfer program

6. *Research and technology demonstration activities shall be actively pursued.*
   - Savannah River Site was first National Environmental Research Park, as such it is a major center for ecological and radioecological research
   - Areas of contamination can provide opportunities for field testing of new cleanup technologies
   - Opportunities for public education on industrial/ecological interactions should be expanded
   - Land use controls and security systems are important to researchers
   - Savannah River Site should continue a strong technology transfer program
7. *Natural resource management activities in non-nuclear and non-industrial zones shall actively pursue biodiversity.*
   - Biological diversity shall be encouraged on Savannah River Site lands with special emphasis on non-industrial areas.
8. *Increased recreational opportunities shall be actively promoted (with appropriate controls and/or restrictions).*
   - Current recreational activities can and should be expanded
   - Other recreational activities should be considered with appropriate restrictions
9. *Should the federal government decide to sell any of the Savannah River Site land, then former landowners (as of 1950-52) and/or their descendants shall have first option to buy back their formerly owned land for uses consistent with land use zones and appropriate standards.*

BACKUP INFORMATION

The following information is provided to explain each part of the recommendation in more detail. Each subpart of the recommendation is in the boxed areas shown below with an explanation following the box.

(1) Savannah River Site boundaries shall remain unchanged and the land shall remain under the

ownership of the federal government; national security shall not be compromised. Private use of the land will be implemented by lease agreement.

- Unforeseen national needs may occur
- Fair market value of the land is less than estimated cost of remediation

The federal government must remain the owner of the current Savannah River Site land area for future, unforeseen national needs that might require such a land area; it would be difficult to obtain such a large land area today. The federal government also is liable for the cleanup required by environmental laws consistent with land use described in this document and the Citizens Advisory Board Recommendation Number 8.

(2) Multiple uses (excluding residential) shall be considered for individual Savannah River Site zones. Land use planning shall be directed toward subdivision of the site into nuclear (defense and commercial), non nuclear, and environmentally protected sectors. Industrial development may only be located in industrial zones.

- Currently many land areas have several non-conflicting uses
- Small areas can be dedicated to specific use
- Examples of concurrent multiple uses include remediation research, ecological research, recreational, ecological preserves, and education and research areas

Savannah River Site must be managed in such a way the that the majority of the site land is available for an urgent national need if required in the future. The 310-square mile Savannah River Site is a multiple-use site now (1995) with many land areas having several different, non-conflicting uses with small areas dedicated to a specific use. This multiple use should continue. In the Recommendation Number 8 map , the primary use is shown for industrial areas, but other non-conflicting uses can be made in these industrial areas. For non-industrial areas, it is not always possible to distinguish between forest and wildlife management, recreational, ecological preserves, education, and research areas, as many of these uses occur simultaneously on the same area of land. Examples of concurrent, multiple uses include environmental remediation research, ecological research, and habitats for endangered species. Additional data exists in the *Savannah River Site Land Use Baseline Report*, June 1995. The Recommendation Number 8 map and this document should be used as a basis for site planning.

(3) Residential uses of Savannah River Site are to be prohibited.

- Liability concerns and public perceptions of risk would make it difficult to market Savannah River Site land
- Residential development is not consistent with meeting the goals of unforeseen national needs

(4) Future use planning shall consider the full range of worker, public, and environmental risks, benefits, and costs.

- Risks, costs, and resulting benefits must be studied before decisions are made
- Risks inherent in remediation must be considered (Example: transportation)
- Public wants to see appreciable benefits and risk reduction for costs of remediation

- Studies of human and ecological health must continue

(5) Commercial industrialization of industrial areas (about 1/3 of the land) shall be actively pursued. Within industrial zones the land is available for multiple use and non-conflicting multiple uses may continue after a site is industrialized.

- To ensure viability of local region, additional industrialization is needed
- Opportunity to demonstrate how well industry can be integrated with environmental park
- Future industrial siting should consider use of adjacent land and incorporate appropriate buffer
- ndustrial development should be encouraged
- Industrial sites include industrial uses and groundwater plumes and 1000-foot buffer
- Industrial cleanup standards should be applied to industrial areas
- Areas of contamination can provide opportunities for field testing of new cleanup technologies
- Opportunities for public education on industrial/ecological interactions should be expanded
- Land use controls and security systems are important to researchers
- Savannah River Site should continue a strong technology transfer program

Industrial uses are further subdivided into current (1995) and possible industrial zones on the Recommendation Number 8 map. The site should continue to develop a strong technology transfer program that is the basis for new private industrial development. These industrial areas also include groundwater contamination plumes with a 1000-foot buffer that are an integral part of the Citizens Advisory Board Recommendation 2 of January 24, 1995. Monitoring the groundwater plume should continue and control activities should protect the public health. In industrial areas, protection can be obtained by providing alternative sources of drinking water. Industrial cleanup standards should generally be applied to industrial areas.

The industrial zones are divided into nuclear and non-nuclear zones. Either government or private enterprise (under long-term leases) could establish new missions in these zones but each specific proposed site would undergo the specific site-use approval process and appropriate environmental reviews (National Environmental Policy Act, Clean Water Act, Clean Air Act, Endangered Species Act, wetlands protection, Resource Conservation and Recovery Act, et cetera) before final approval.

In general, the nuclear zone is near the center of the site and includes the existing nuclear facilities. The non-nuclear industrial zone is near A, M, B, D and TNX areas and along Highway 125 between Savannah River Site Roads 1 and 6. Within these zones, other activities could take place such as timber operations, wildlife management, environmental research, and field-related educational activities until a specific area is needed for industrial development. If any land is removed from an industrial zone through rezoning, then cleanup levels for contaminated areas must be re-evaluated.

The remaining portions of the land are designated for multiple use (that is, forest and wildlife management, recreational, ecological preserves, and education and research). These areas should be cleaned up to recreational standards with appropriate controls established on the use of the land.

As an example of an area that needs appropriate controls, some Savannah River Site lands have residual contamination from past releases from Savannah River Site facilities. In particular, there is cesium-137 contamination in many of the Savannah River Site waterways from releases in the 1960s. These are detectable, are above global background levels, are well mapped, and are being allowed to radioactively decay in place. (Cesium-137 has a 30-year half life.)

Besides cesium-137 there are other radionuclides detectable above global background levels in the Savannah River Site (that is, tritium, uranium, iodine-129, plutonium-238, plutonium-239, carbon-14, et cetera); but the same commitments on appropriate controls should apply.

Existing areas of contamination at Savannah River Site provide an opportunity for field testing of new cleanup technologies. This type of activity should be increased to develop more cost-effective technologies for cleanup throughout the United States. Savannah River Site, with its land area and technical staff, is an ideal location to perform these field tests.

There is currently a system in place to approve and coordinate specified land uses at Savannah River Site; this should continue as a method of appropriate controls of land use.

(6) Research and technology demonstration activities shall be actively pursued.

- Savannah River Site was first National Environmental Research Park, as such it is a major center for ecological and radioecological research
- Areas of contamination can provide opportunities for field testing of new cleanup technologies
- Opportunities for public education on industrial/ecological interactions should be expanded
- Land use controls and security systems are important to researchers
- Savannah River Site should continue a strong technology transfer program

The primary land use in the Education and Research category is for student and public education, research on the structure and function of ecosystems, and the interaction of industrial facilities with the environment. Basically this can be done on any of the 310-square miles of the Savannah River Site on a non-interfering basis through specific site-use requests approved by Department of Energy. The ability to have a protected environmental research field site, because of land use control and security systems at Savannah River Site, is a very valuable attribute for researchers. Education and research facilities should be maintained and operated throughout the site by a variety of contractors.

Savannah River Site was the first National Environmental Research Park designated by the Department; is a major center of ecological research; and is the major field site for radioecological research in the United States. It is considered a national asset because it is uniquely suited for the demonstration of new environmental restoration technologies. These research and technology demonstrations should be actively pursued.

(7) Natural resource management activities in non-nuclear and non-industrial zones shall actively pursue biodiversity.

- Biological diversity shall be encouraged on Savannah River Site lands with special emphasis on non-industrial areas.

Presently Savannah River Site has about 90% of its land used for timber production, natural resource and wildlife management, and environmental research. This research includes studying thermal effects on aquatic organisms, studying the effects of coal power plants on the environment, studying the transfer of radionuclides through various environmental pathways, et cetera; these activities should continue and be increased. Opportunities for public education on these industrial/ environmental interactions should be expanded.

Ecological preserves have been established and should continue to be protected to follow the evolution of natural ecosystems over time. Biodiversity should be encouraged with special emphasis on non-industrial areas. Limited use should be made of this area for education and research, as long as any man-made disturbance to the area is at an absolute minimum. If any waste sites exist in these areas and if any cleanup is required, it should be done with an absolute minimum impact on the environment. Department of Energy, with stakeholder input, shall identify the areas of major set-asides as ecological preserves.

(8) Increased recreational opportunities shall be actively promoted (with appropriate controls and/or restrictions).

- Current recreational activities can and should be expanded
- Other recreational activities should be considered with appropriate restrictions

The Savannah River Site lands can and should provide major opportunities for public recreation. Some recreational activities occur now (that is, deer and hog hunting), but this can and should be actively promoted so that local residents can benefit from such opportunities. Examples include turkey hunting; hiking, biking and horseback riding trails; fishing; boating, et cetera There should be appropriate restrictions on some recreational activities such as water skiing, swimming, et cetera

(9) Should the federal government decide to sell any of the Savannah River Site land, then former landowners (as of 1950-52) and/or their descendants shall have first option to buy back their formerly owned land for uses consistent with land use zones and appropriate standards.

Due to the concern of former residents of the land where Savannah River Site is now located, the Citizens Advisory Board believes that this group of people should have the right of first refusal to buy their formerly owned land, if it should ever become available. Evaluation of the particular parcels of land and cleanup to Comprehensive Environmental Restoration, Compensation and Liability Act residential standards must be done by the federal government prior to the release of that land. However, the Citizens Advisory Board does not believe this land should be available for sale.

CONCLUSION

Thus, in the 21st century, the Savannah River Site will continue and strengthen its role as the premier national environmental research park with the addition of new major missions: meeting the government needs, developing industrial uses with private industry, stabilizing closed nuclear facilities, cleanup of environmental contamination, enhanced educational opportunities and ecological research and developing recreational opportunities. Careful planning, adequate resources, and determined execution will result in harmonization of these missions.

APPENDIX 1

Land Use Categories, As Defined Under Comprehensive Environmental Restoration, Compensation and Liability Act Guidance Documents

Under current environmental guidance document, when deciding the appropriate technology for cleanup and the resulting costs, a risk assessment is done to determine the risks once a future land use is determined. The guidance includes the following definitions and guidance for various risks:

Residential -- Residential exposure scenarios and assumptions should be used whenever there are or may be occupied residences on or adjacent to the site. Under this land use, residents are expected to be in frequent, repeated contact with contaminated media. The contamination may be on the site itself or may have migrated from it. The assumptions in this case account for daily exposure over the long term and generally result in the highest potential exposures and risk.

Commercial/Industrial -- Under this type of land use, workers are exposed to contaminants within a commercial or industrial site. These scenarios apply to those individuals who work on or near the site. Under this land use, workers are expected to be routinely exposed to contaminated media. Exposure may be lower than that under the residential scenarios, because it is generally assumed that exposure is limited to 8 hours a day for 250 days per year.

Agricultural -- These scenarios address exposures to people who live on the property (that is, farm family) and agricultural workers. Assumptions made for worker exposures under the industrial/commercial land use may not be applicable to agricultural workers due to differences in workday length, seasonal changes in work habits, and whether migrant workers are employed on the affected area. Finally, the farm families live in the area.

Recreational -- This land use addressed exposures to people who spend a limited amount of time at or near the site while playing, fishing, hunting, hiking, or engaging in other outdoor activities. This includes what is often described as the "trespasser" or "site visitor" scenario. Because not all sites provide the same opportunities, recreational scenarios must be developed on a site-specific basis. Frequently, the community surrounding the site can be an excellent source of information regarding the current and potential recreational use of the site. The RPM/risk assessor is encouraged to consult with local groups to collect this type of information.

In the case of trespassers, current exposures are likely to be higher at inactive sites that at active sites because there is generally little supervision at abandoned facilities. At most active sites, security patrols and normal maintenance of barriers such as fences tend to limit (if not entirely prevent) trespassing. When modeling potential future exposures in the baseline risk assessment, however, fences should not be considered a deterrent to future site access.

Recreational exposure should account for hunting and fishing seasons where appropriate, but should not disregard local reports of species taken illegally. Other activities should also be scaled according to the amount of time they actually occur, for children and teenagers, the length of the school year can provide a helpful limit when evaluating the frequency and duration of certain outdoor exposures.