

4.5 Cumulative Impacts

This section presents cumulative impacts from the Proposed Action on the River Water System when it is added to impacts from past, present, and reasonably foreseeable onsite activities and impacts of nearby offsite industrial facilities. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable activities regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collective significant actions taking place over a period of time" (40 CFR 1508.7).

Associated actions are another component of this cumulative impacts section. This analysis considers associated actions that could not or would not proceed unless other actions were taken previously or simultaneously. Impacts associated with these actions are considered collectively with the direct impacts of the Proposed Action coupled with the impacts of past, present, and reasonably foreseeable activities.

This analysis assesses cumulative impacts for the Shut Down and Deactivate Alternative because the No-Action Alternative would have minimal effects (i.e., ongoing transitions due to limited discharges from the River Water System) and impacts generally would not vary between the two shutdown alternatives. Potential impacts under the Shut Down and Deactivate Alternative would be the worst case scenario because DOE could not restart the system. Under the Shut Down and Maintain Alternative, DOE preserves the capability to pump water from the River Water System if conditions or mission changes require system operation (e.g., recover from unlikely drawdown of Par Pond).

This section discusses cumulative impacts for air resources and public and occupational health. Impacts in other resource areas (e.g., geologic resources, surface and groundwater resources, aesthetic resources, and land use) are

not included because the impacts of the Proposed Action would be small, and their potential contribution to cumulative impacts would be negligible. Sections 4.1.5, 4.2.5, and 4.3.5 on ecological resources have captured the cumulative effects and, therefore, are not repeated in this section. The baseline aspects of each component (terrestrial resources, aquatic resources, wetlands, and threatened and endangered species) are covered in the affected environment sections, and the incremental impact of the actions under each alternative are added to that baseline to define the cumulative impact. In the analysis DOE considers impacts identified in Sections 4.3.4.3 (combined atmospheric impacts) and 4.3.8.3 (combined occupational and public health impacts) coupled with emissions from existing and planned facilities or activities and background concentrations. This analysis includes the following facilities or activities:

- Existing facilities and activities:
 - Savannah River Technology Center
 - F- and H-Area Separations Facility
 - Replacement Tritium Facility
 - F/H-Area Effluent Treatment Facility
- Future facilities and activities:
 - Proposed facilities and actions associated with SRS waste management
 - Proposed facilities and actions associated with interim management of nuclear materials
 - Proposed facilities and actions associated with stabilization of plutonium solutions
 - Proposed facilities and actions associated with the Defense Waste Processing Facility
 - Proposed facilities and actions associated with SRS spent nuclear fuel

- Offsite facilities:
 - Vogtle Electric Generating Plant

4.5.1 ASSOCIATED ACTIONS

DOE has identified five closely related actions that could be associated with those being considered in this EIS.

- L-Lake Site Evaluation
- Remedial Action Process for Onsite Streams
- K- and L-Area Auxiliary Equipment Cooling
- Wastewater Discharges to Onsite Streams
- K- and L-Area Fire Protection Services

L-Lake Site Evaluation

An internal draft L-Lake remedial site evaluation has resulted in a DOE recommendation for further investigation of the lake under the FFA. Because actions being considered by DOE in this EIS could accelerate the emergence of potential hazards being evaluated under the FFA, DOE believes that the identification and selection of potential remediation strategies for L-Lake is associated with the Proposed Action in this EIS.

Remedial Action Process for Onsite Streams

Par Pond, Steel Creek, Fourmile Branch, Pen Branch, and Lower Three Runs are on the RCRA/CERCLA Units List and will receive future evaluation and potential remedial actions under the requirements of the FFA. The extent of flow reduction in these streams is the same under both shutdown alternatives being evaluated in this EIS; such a reduction could accelerate the emergence of potential hazards being evaluated under the FFA. Accordingly, DOE believes that the identification and selection of potential remediation strategies for the site streams is an associated action and a potential impact if it implements the Proposed Action. DOE believes the FFA actions on L-Lake and onsite streams and the actions in this EIS are

related because FFA activities in total could initiate NEPA documentation. The form of documentation would probably follow the preferred strategy of integrating NEPA values in the regulatory documents (DOE 1994b).

K- and L-Area Auxiliary Equipment Cooling

If the Proposed Action or either of its alternatives is implemented, auxiliary equipment (chilled water and compressed air systems) in the K- and L-Areas will lose their cooling water supply. As a cost saving initiative, DOE replaced the water-cooled chilled water system with an air-cooled system and switched compressed air system cooling loads to well water systems in both areas. Also, about 210 gallons per minute (0.013 cubic meter per second) and 190 gallons per minute (0.012 cubic meter per second) of well water are supplied to the compressed air systems in the K- and L-Areas, respectively. Therefore, before operation of the small pump, DOE has provided well water to meet current equipment cooling water requirements.

Wastewater Discharges to Onsite Streams

If DOE implements the Proposed Action, it has determined that sanitary wastewater from L-Area would not meet SCDHEC water quality criteria without blending from other area sources. Reliable blending water sources do not exist and consequently DOE must select an alternative wastewater treatment option for L Area (Section 4.1.2 discusses this alternative's options). Therefore, DOE believes that the selection and installation of a new sanitary wastewater treatment method in L-Area is an associated action, having cost impacts only. DOE would implement the least costly environmentally satisfactory option, which is a septic tank and tile field.

K- and L-Area Fire Protection Services

DOE will continue to use the 25-million-gallon (1,600-cubic-meter) 186-Basins in the K- and L-Areas as the long-term fire protection water

supply sources in those areas. If the River Water System is shut down, approximately 200 gallons per minute (0.013 cubic meter per second) of water would be added to each 186-Basin to ensure that the required reserve capacity is maintained. This make-up capacity would be provided by the existing K- and L-Area well water system. Piping alignments to the well water systems in both areas to supply the 186-Basins are associated actions, the impacts of which would be bounded by historic well water withdrawal rates. DOE believes that auxiliary equipment cooling replacement of river water blending for L-Area sanitary wastewater and K- and L-Area fire protection services are associated actions because the Proposed Action would not proceed until it implemented these actions.

4.5.2 AIR RESOURCES

Section 4.3.4.3 describes potential total maximum ground-level concentrations at the SRS boundary resulting from resuspended dried lakebed sediments from L-Lake and Par Pond. Table 4-72 lists the cumulative maximum SRS boundary line ground-level concentrations for air toxics (antimony, arsenic, beryllium, cadmium, lead, manganese, and mercury) and the criteria pollutant (PM₁₀) that could be released from dried lakebed sediments. This table also summarizes the combined releases associated with Par Pond and L-Lake, emissions from existing SRS facilities, background concentrations, and emissions expected from future activities. These data demonstrate that total modeled concentrations of nonradiological air pollutants from the SRS, including those from

the River Water System shutdown, would be below regulatory standards.

Similarly, the concentrations of radioactive constituents would be very low. The combined airborne maximum-boundary line concentrations of cesium-137 and cobalt-60 from L-Lake and Par Pond would be 1.6×10^{-4} and 6.1×10^{-7} picocuries per liter, respectively. The cumulative impacts in terms of annual dose equivalents and health effects is discussed in the following section.

4.5.3 PUBLIC AND OCCUPATIONAL HEALTH

Sections 4.1.8 and 4.3.8 describe potential radiological releases from contaminated sediments of L-Lake and Par Pond, respectively. Table 4-73 lists the radiological doses to the hypothetical maximally exposed individual and the offsite population for the public and workers due to the exposures resulting from current and future SRS activities, including shutdown of the River Water System, and from offsite sources. The cumulative dose could result in an additional latent cancer fatality risk of 9.6×10^{-7} per year to that individual and a total of 0.033 additional cancer fatality per year to the 80-kilometer (50-mile) population from releases of radioactivity. The shutdown of the River Water System would account for approximately 0.4 percent of these effects. The cumulative impact could result in 0.31 additional latent cancer fatality to onsite workers; the shutdown of the River Water System would account for a negligible percentage (0.004 percent) of these health effects.

4.6 Unavoidable Adverse Impacts

The shutdown of the River Water System at the Savannah River Site would result in some adverse impacts to the environment. The impact assessment in this EIS identifies potential adverse impacts; the following paragraphs discuss those that would be unavoidable.

The recession of L-Lake associated with the shutdown alternatives would generate transient

and minor air impacts as a result of minimal increases in the concentration of particulate matter less than 10 microns in diameter (PM₁₀) and slight increases in air toxics (including manganese, chromium, mercury, and beryllium).

These impacts coupled with those from existing operations and background values would still