

stabilization. Activities that involve transportation of the plutonium solutions would involve all the risks associated with the alternatives for stabilization plus the risks and costs associated with transportation of radioactive liquids. Activities such as purification of the plutonium solutions by operating the second plutonium cycle in F-Canyon would reduce but not eliminate the risks associated with storing liquid plutonium solutions. In addition, operation of only the second plutonium cycle to purify plutonium solutions would require process development work and establishment of operating parameters, because the F-Canyon process has never been operated in this manner. One important issue associated with this approach would be unprecedented high levels of radiation in the second cycle portion of the facility due to the greatly increased presence of fission products.

III. Environmental Impacts of Alternatives

The Final F-Canyon Plutonium Solutions EIS evaluated the environmental impacts of the alternatives, including the no action alternative. DOE analyzed the potential impacts that would result from implementation of the alternatives and believes there would be minimal impacts in the areas of geologic resources, ecological and cultural resources, socioeconomics, aesthetics and scenic resources, and noise. This is because implementation of each of the alternatives would occur within the F-Area and mostly within the F-Canyon building. In light of planned SRS workforce reductions, any jobs associated with implementation of any of the alternatives could be filled through reassignment of current workers, resulting in no discernible impact on the regional economy.

Radiological health effects on workers from normal operations would be small for any alternative, much less than one additional cancer death (0.2 latent cancer fatalities for the no action alternative and less for the other alternatives) during the lifetimes of the affected individuals. The effect on the general public could be at most 0.0006 additional cancer deaths (for the processing to oxide and vitrification in F-Canyon alternatives, and less for the other alternatives) in the general population within 80 kilometers (50 miles) of the SRS. This is to say that no latent cancer fatalities in either workers or the general population are expected to occur as a result of routine operations. DOE expects similarly small adverse nonradiological health effects to

workers and the public from emissions of toxic pollutants. Because discharges and emissions would vary little among the alternatives, public health effects would vary little among the alternatives. The analysis in the EIS shows that these potential small impacts would not disproportionately affect minority or low income populations.

Implementation of any of the alternatives, including the No Action alternative, would result in a risk of accidents. The Final EIS evaluates a spectrum of potential accidents for each alternative. To enable a relative comparison of potential impacts among the alternatives, the accident with the highest reasonably foreseeable consequence for each alternative was assumed to occur and the maximum potential effects (latent cancer fatalities) were calculated. The projected frequency for these high-consequence accidents ranged from once in 17,000 years for a plutonium solutions fire involving solvents to once in 5,000 years for a severe earthquake. The maximum potential effect accident, although with a low probability, during the storage of plutonium solutions (for the periods prior to stabilization and for the No Action alternative) and during F-Canyon operation for stabilization is about 6 latent cancer fatalities to the exposed offsite population. For the stabilization actions involving FB-Line operations (processing to metal or processing to oxide), the maximum potential effect from an accident is less than 2 latent cancer fatalities in the exposed offsite population. Following stabilization and during stabilized plutonium storage, the maximum potential effect from an accident is less than 1 latent cancer fatality in the exposed offsite population.

The SRS generates several different types of waste, including low-level waste, high-level waste, transuranic waste and mixed waste. The Final EIS lists estimates of waste generation for each alternative. DOE estimates that the smallest increase for all waste types would occur if the processing to plutonium metal alternative were implemented. Implementation of this alternative would eventually result in high-level waste equivalent to 40 Defense Waste Processing Facility (DWPF) high-level waste canisters. The largest increase in high-level waste would occur if the vitrification in DWPF alternative were implemented. The largest increase in saltstone and low-level waste generation would result from implementing the processing to oxide alternative. None of the alternatives is expected to generate substantial quantities of mixed waste.

With the exception of vitrification in DWPF, the impact on SRS waste management capacities from implementing any of the alternatives would be minimal because the Site can accommodate all the waste generated with existing and planned radioactive waste storage and disposal facilities.

It would not be appropriate under any of the alternatives that would result in stabilized plutonium to characterize the stabilized plutonium as waste. The alternatives for the disposition of surplus weapons-usable plutonium are currently being examined in a programmatic environmental impact statement that is scheduled for completion early next year. The nitric acid that is associated with the plutonium solutions likewise should not be characterized as waste. The nitric acid historically was introduced into the separations process to dissolve irradiated materials and provide for criticality/radiological safety by maintaining the plutonium in solution pending stabilization. The nitric acid continues to serve this vital safety function. The South Carolina Department of Health and Environmental Control (SCDHEC) agrees with DOE that the F-Canyon plutonium solutions should not be regulated as a mixed waste (Letter, R. Lewis Shaw, SCDHEC to Frank R. McCoy, III, DOE, January 26, 1995).

IV. Other Factors

In addition to examining the environmental impacts of the alternatives, DOE also considered other factors related to the stabilization of the F-Canyon plutonium solutions. These factors are: (1) new facilities that would be required, (2) security and nuclear nonproliferation, (3) implementation schedule, (4) technology availability and technical feasibility, (5) labor availability and core competency, (6) degree of reliance on aging facilities, and (7) post-stabilization custodial care required. The processing to plutonium metal alternative would be the most advantageous for all factors except: (2) security and nuclear nonproliferation and (6) reliance on aging facilities.

The processing to oxide and vitrification alternatives would involve minimal reliance on aging facilities because they would use new facilities for the final step involved in stabilizing the plutonium and for storing the plutonium after completion of stabilization. The processing to metal alternative would use existing facilities to stabilize the plutonium solutions.

The vitrification alternatives would be preferable from the security and nuclear nonproliferation standpoint because