Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF DEBBIE KEARNEY	
CM-1	"Since the splitting of the atom, everything has changed save our mode of thinking ... and thus we drift towards unparalleled catastrophe." I'm paraphrasing Albert Einstein. He obviously recognized the dangers inherent in nuclear power. Yet DOE treats the reconstruction and restart of the L-Reactor like it's the opening of a shoe store. No big deal. What's the public uproar about?! I'm testifying at this hearing because I think it is a big deal. I'll refrain from a repetition of the major concerns I have, like health and safety hazards and ecosystem losses. I've delineated them in other testimony. You're aware of my concerns and I suspect you give the same pat answers. And then say "Trust us." Well--you've given me no reasons to trust you and many reasons to doubt you.	From the outset, DOE has emphasized the protection of the public health and safety in conjunction with the restart of L-Reactor. As described in the EIS, DOE has expended about $204 million in modernizing and renovating L-Reactor. The Department has also spent more than $5 million in environmental studies and reports. Twelve public hearings have been held in South Carolina and Georgia, to elicit public comments. Also see the responses to comments AA-1, AA-3, and AB-13 regarding cooling-water mitigation alternatives and DOE's commitment to comply with all applicable state and Federal environmental protection regulations, the response to comment BF-7 regarding containment, and the response to comment BQ-2 regarding existing oversight mechanisms.
CM-2	My understanding of the conclusions drawn in the draft EIS is that greater safety features and better cooling alternatives cannot be implemented because they cost too much in time and money. In other words, the health and safety of thousands of people downriver and downwind from SRP aren't worth such and so million $ and a few years. I strongly object to a value system that puts time and money considerations before people considerations!!	See the response to comment BM-1 regarding DOE's Record of Decision on this EIS.
CM-3	What's even more outlandish is that we discuss this issue as if we know exactly what the costs of restarting the L-Reactor will be--I mean costs in terms of environmental damage and subsequent consequences, human health and safety, as well as time and money. The fact is that we don't. We DO NOT KNOW what the cumulative effects of the nuclear operations at SRP are and will be. We continue to produce more plutonium and tritium without knowing what to do with the radioactive waste we	Section 5.2 of the EIS describes the cumulative effects of present and proposed SRP facilities and those of other nuclear operations in the vicinity of SRP. Also see the response to comment AV-2 regarding radioactive waste disposal, and the response to comment CG-4 regarding infant mortality rates.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	already have. We allow SRP to continue production without questioning the fact that the counties south of SRP have an infant mortality rate 5 times greater than the rest of S.C. and S.C. has the highest infant mortality rate in this country!!	
CM-4	If the L-Reactor is going to be restarted (and it seems that no matter what we do, it will go on-line), I feel I have a right as a citizen to ask--demand--that certain protective actions be taken first. I'd like the restart contingent upon a cooling alternative like cooling towers, greater safety mechanisms (I'd like to see a containment dome built), and an independent oversight committee composed of government officials and concerned citizens as suggested by Rep. L. Thomas. Most important, I want a long-term study of the cumulative effects of SRP on the environment and on the people. Please spare me the argument that there's no time. There are *alternatives if the plutonium and tritium must be produced* immediately which I also question. If you think I'm angry you're right. And if you detect cynicism and a sense of futility, you're right about that too. I desperately want Savannah and this coastal area to be a safe, healthly, beautiful and bountiful place. The SRP is a major threat. If we must start new reactors, let's at least require that they have the maximum health and safety features. And give consideration to the <u>real</u> costs of starting a reactor.	See the responses to comments AA-1, AA-3, and AB-13 regarding cooling-water mitigation alternatives and DOE's commitment to comply with all applicable state and Federal environmental protection requirements, the response to comment BF-7 regarding containment, and the response to comment BQ-2 regarding existing oversight mechanisms.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF MS. JAY	
	I come here because I am a health care worker and a parent and a concerned citizen of southeastern Georgia.	
CN-1	The startup of the L-Reactor is a concern of those from the surrounding counties because we know nuclear accidents are possible, as was learned from the Three Mile Island incident. A similar accident at the Savannah River Plant L-Reactor would be catastrophic to this area because of the lack of the cooling tower and containment domes in the aging facilities, and the release of increased temperature water would change the local ecosystem of the streams and riverbeds in the area of the plant.	Cooling towers are not related to the mitigation of potential reactor accidents. See the response to comment BF-7 regarding containment domes and safety system mitigation alternatives.
CN-2	I am of the first generation who have had to live our entire lives with the threat of the ultimate annihilation of humankind due to nuclear weapons. Now, a second generation is coming into the world with this over their heads. In some ways, I feel guilty for bringing my daughter into a world where a computer foulup or a flock of geese could cause a full-scale nuclear war.	The national policy on nuclear weapons, their deployment, and the need for increased weapons is beyond the scope of this EIS.
CN-3	To me, the ultimate question of the L-Reactor startup is: Do we need more nuclear weapons...? I request the formulation of an oversight committee for the operation of the Savannah River Plant L-Reactor and the installation of containment domes.	See the response to comment BQ-2 regarding existing oversight mechanisms, and the response to comment BF-7 regarding containment domes.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF JUDY JENNINGS	
	November 4, 1983	
	My name is Judy Jennings. I am a housewife and I have lived in Savannah, Georgia, for six years.	
CO-1	I appreciate the opportunity to speak to you but I admit I am somewhat puzzled. I read every day that many citizens and many Congressmen oppose further build-up of nuclear weapons and support alternatives such as the Build Down Proposal and the Nuclear Freeze. If we are really dedicated to reducing the threat of nuclear war, why do we need another facility such as the L-Reactor at the Savannah River Plant to produce more fuel for more nuclear weapons?	The national policy on nuclear weapons, their deployment, and the need for increased weapons is beyond the scope of this EIS.
CO-2	However, if it is inevitable that the L-Reactor operate and if it operates as indicated in the draft Environmental Impact Statement, I feel that my health and life, my friends' and family's health and lives, and the environment will be in constant jeopardy. I would feel safer if the L-Reactor had a containment dome and cooling towers and if an independent oversight committee were established to oversee L-Reactor operations.	See the responses to comments AA-1, AA-3, and AB-13 regarding cooling-water mitigation alternatives and DOE's commitment to comply with all applicable state and Federal environmental protection regulations, the response to comment BF-7 regarding containment, and the response to comment BQ-2 regarding existing oversight mechanisms.
CO-3	Basically, I would like to see the EPA or NRC review the draft Environmental Impact Statement. Thank you.	The Georgia Department of Natural Resources, the South Carolina Department of Health and Environmental Control, the Nuclear Regulatory Commission, and other Georgia, South Carolina, and Federal agencies received copies of the EIS. As required by the Energy and Water Development Appropriations Act, 1984, the EIS was developed in consultation with the States of Georgia and South Carolina. DOE provided working drafts of the EIS to the states, met with their representatives, and incorporated their comments into the EIS.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	COASTAL CITIZENS FOR A CLEAN ENVIRONMENT 4405 PAULSEN ST., SAVANNAH, GA 31405 STATEMENT BEFORE THE DEPARTMENT OF ENERGY BY REBECCA R. SHORTLAND FOR COASTAL CITIZENS FOR A CLEAN ENVIRONMENT ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE RESTART OF L-REACTOR Savannah, GA. November 4, 1983 My name is Rebecca R. Shortland and I am here on behalf of Coastal Citizens for a Clean Environment (CCCE). This is the third occasion during which CCCE has presented testimony in response to the Department of Energy's (DOE) mandate - to restart the L-Reactor at the Savannah River Plant without certain safeguards, which we feel, and have felt since August 1982, are vehemently necessary. Our comments are directed to the Draft Environmental Impact Statement (DEIS), which exists because it was required by an act of Congress and the courts, not because DOE chose to voluntarily follow the NEPA process.	
CP-1	In reviewing this document, we find that the overall attitude is precisely that which was the result of the Environmental Assessment (EA) conducted by DOE and released in 1982 - no significant impact as the result of the proposed operation of L-Reactor. Our concerns have been expressed many numbers of times since the EA was released, and echoed by many others including our Congressmen, local officials and various organizations and individuals in both Georgia and South Carolina. The concerns and questions remain the same.	See the response to comment BM-1 regarding DOE's Record of Decision on this EIS.
CP-2	Again, we reiterate the need for an alternative and adequate system for recycling of the cooling waters other than that proposed by DOE (direct discharge into Steel Creek). The resulting destruction of 1000 acres of wetlands, the subsequent ruin of wildlife habitat (including that of endangered species), and the resuspension of radioactive cesium and cobalt into the Savannah River are unacceptable. The construction of an alternative, such as cooling towers with complete recycling, is	See the responses to comments AA-1, AA-3, and AB-13 regarding L-Reactor coooling-water mitigation alternatives and compliance with applicable environmental protection requirements, and the response to comment AA-2 regarding resuspension of radiocesium and radiocobalt. The EIS has been revised to reflect the current status of consultations on endangered species.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	necessary and possible in order to eliminate this ruinous impact and the threat that it poses to human health.	
CP-3	Additionally, an alternative and adequate system for containment of L-Reactor is mandatory. The existing containment would not shield the environment and its people from distribution of radioactive gases in the event of an accident at L-Reactor. The DEIS emphasizes the "low" probability of such an incident. However, that low probability is a far cry from no probability when so much is at stake.	The existing SRP airborne activity confinement system is designed to trap more than 99 percent of the iodine and particulates that would be released as a result of a reactor accident. Noble gases and tritium releases would not be trapped but would be dispersed by a 61-meter stack. With the SRP confinement system, the consequences of all credible accidents are well within the NRC reference values for reactor siting (10 CFR 100). Also, see the response to comment BF-7 regarding containment. Neither a containment nor improved confinement system would be capable of eliminating potential consequences from all very-low-probability accidents.
CP-4	Because there is a demonstrated conflict of interest between DOE's production and safety goals, we believe an independent oversight committee should be established. "Independent" is defined as outside of DOE, DuPont or NUS Corp.; however, a representative would be included in the Committee. Other proposed participants could include representatives from the states of Georgia and South Carolina, the U.S. EPA, the Nuclear Regulatory Commission (NRC), as well as citizen representation. This later element could, perhaps be filled by choosing representatives from the plaintiffs (those involved in the legal action over L-Reactor's restart), and representatives of regional community organizations or local officials. We believe that such a committee could succeed in improving the public's confidence in DOE's operations and create needed guidelines.	See the response to comment BQ-2 regarding existing oversight mechanisms.
CP-5	We also call for the cessation of the use of seepage basins at SRP as the method for disposal of highly toxic and radioactive substances, which then leak into our water supplies, both surface and ground water. And, in particular, we object to the initiation of yet another seepage basin for use with L-Reactor. The above points are but a few of the concerns which we have expressed to date, but those which we believe must, and can, be implemented prior to the restart of L-Reactor. The DEIS does address many of the variety of points posed by CCCE and	See the responses to comments AJ-1 and BG-4 regarding the use of seepage basins and DOE commitments for ground-water protection.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
CP-6	others. However, we believe the DEIS is inadequate. One example is the material gathered in the scoping process. The DEIS scope is based upon information from hearings in February and May of this year, as well as other sources. However, there are errors and deletions of oral testimony in these documents, which lead us to believe the scoping process is incomplete.	DOE based its preparation of the draft EIS on comments received in the Environmental Assessment from August 1982 to August 1983; on the February 9, 1983, Senate Armed Services Committee Hearings; on the 90-day public review and comment period on the record of the Senate Armed Services Committee hearing from April 18 through July 17, 1983; and on a 22-day scoping comment period and hearings on the DEIS that ended August 14, 1983. This EIS addresses the substantive comments that were received. All hearings and meetings conducted by DOE in May and August were recorded by certified court reporters verbatim and published in hearing records/scoping reports. DOE knows of no errors or deletions of oral testimony.
CP-7	As the DEIS stands, DOE's conclusions can be summarized in one statement (p. 4-82) - "Any alternative that postulates a delay of the restart necessarily results in a loss of production that cannot be recovered." The loss in question is the production of nuclear materials, plutonium and tritium, for our country's nuclear weapons program. We dispute DOE's claim for the need based on available documents and occurrences since the mandate was determined in the Carter Administration. But, further, should we accept these claims, whether the "need" is in the form of actual deteriorating warheads, surplus, or in the form of a statement to the Soviet Union, there are alternatives. This administration and DOE directly have proposed the increase of output of nuclear materials through several alternatives to be implemented in the near future, one of which is L-Reactor. We believe it is possible to shift the focus of implementation which would create the drastically needed time to affect the above safeguards, so that the impacts on our lives in this region would be less detrimental.	The statement given on page 4-82 of the draft EIS represents an "impact" from the implementation of a mitigation alternative and is one factor in evaluation of the alternatives. Also see the response to comment BL-18.
CP-8	Because the DEIS does not adequately investigate all of the alternatives, we view this document as insufficient and incomplete. We request that DOE reevaluate the feasibility of combined and expedited sources so that initiatives toward the proper control mechanisms can begin as soon as possible, and thereby avoid the possibility of even further delays in restarting L-Reactor.	See the responses to comments AB-2 and BL-15 regarding information contained in the EIS on need and production alternatives.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
CP-9	Throughout the DEIS, as was the case in the EA, the inflexible "need" for nuclear materials is repetitively pitted against our health, our safety and the quality of our environment. Assuming that the above requirements for proper controls could indeed be met without the immediate restart of L-Reactor, and the DOE chooses to turn its back on this possibility, can they justify the probability of accelerated contamination of our air and water supplies, the destruction of our vital wetlands (which are being eliminated worldwide at an alarming rate), and the impacts on the health and safety of the people in this region. And, further, can you justify the cost with which we the taxpayers will be charged in the aftermath of your decisions.	See the response to comment BL-15 regarding the need for defense nuclear material, the response to comment BM-1 regarding DOE's Record of Decision on this EIS, and the response to comment AA-3 regarding DOE's commitment to comply with all applicable Federal and state environmental protection requirements.
CP-10	For example: How is it possible to justify the use of a seepage basin for L-Reactor when this same method of disposal (in the M-Area) has led to contamination of the aquifer and a clean-up price tag well in the millions of dollars? If these damages can be avoided, how can DOE choose otherwise?	As noted in response to comment BG-4 and in EIS Section 4.4.3, use of the L-Area seepage basin would reduce the radiological dose to users and consumers of Savannah River water. Section 4.4.3 describes alternatives to the use of the L-Area seepage basin. Studies of the hydrostratigraphic units show that conditions at L-Area are different from those at M-Area (Sections 4.1.1.3, 4.1.2.2, and 5.1.1.4). If the L-Area seepage basin is used, analyses indicate that the filtered and deionized disassembly-basin wastewater will seep into the shallow ground water and flow laterally to seepline springs along Steel Creek.
	In conclusion, I again urge DOE and the current Administration to seriously consider the concerns expressed here tonight. These past 15 months of scrutiny of L-Reactor and SRP operations have produced only more intense concerns, not less, despite the mounds of documents produced by DOE and DuPont Corp. We believe the time has long been overdue for DOE to take the positive steps of implementation of the preceding safeguards in order to meet their mission and relinquish the questions of its overall operations. Thank you.	
	ADDITIONAL COMMENT MADE AT PUBLIC HEARING OF NOVEMBER 4, 1983	
CP-11	And I would like to point out the cost of cooling towers is only estimated at some 39 million. That seems to be rather unequivocal in some terms.	Comment noted. Also see the response to comment CP-2.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	Statement Provided by The U.S. Environmental Protection Agency Region IV, Atlanta, Georgia U.S. Department of Energy L-Reactor Restart Savannah River Plant Savannah, Georgia November 4, 1983	
	My name is Arthur G. Linton and I am the Federal Activities Coordinator for Region IV, U.S. Environmental Protection Agency. I am presenting this statement on behalf of Charles R. Jeter, Regional Administrator, Region IV, in Atlanta. It should be recognized that our comments address only environmental concerns and do not attempt to rationalize the need for additional weapons grade nuclear material or the need for the restart of this facility in view of other overriding national concerns.	
CQ-1	The Environmental Protection Agency has a long history of involvement with the environmental affairs at the Savannah River Plant and has been intensely involved in the assessment of environmental concerns during the past year. The Regional Administrator has, for example, presented testimony to the Armed Services Committee chaired by Senator Thurmond on the restart of the L-Reactor on February 9, 1983. Our most recent action in EPA has been the review of the Draft Environmental Impact Statement which was required for the restart of the L-Reactor and we are formally responding to the Department of Energy concerning our position. We have expressed concern over a number of significant environmental issues which remain unresolved or are still under study in an effort to effect mitigation. The most important of these matters are groundwater contamination, discharge of heated effluent into Steel Creek (which will result in the destruction of extensive wetlands) and the uncertainty involving the disposal of various potential and actual hazardous wastes generated from reactor operations.	See the DOE response to the entire EPA comment letter included as comment letter "DA" in this appendix.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	On the basis of these concerns, we have rated the Draft EIS as EU-2, that is, we have determined that the L-Reactor restart is environmentally unsatisfactory in its currently proposed design in that the document does not provide sufficient information regarding the corrective measures that will be employed to avoid adverse environmental impacts. We know that the DOE is presently working on developing these measures, in cooperation with the regulatory agencies. We believe that much of the additional information that we have requested is already available to you and should be included in the Final EIS. Of special concern to us is the development of a proper permit under the National Pollutant Discharge Elimination System (which is administered by the State of South Carolina), and the methods to control the contamination of groundwater, and the treatment and disposal of various potential and actual hazardous wastes generated from reactor operations. We will continue to coordinate with the state agencies and DOE with respect to utilizing the regulatory mechanisms that are in place, to insure that the environmental concerns addressed above can be satisfactorily resolved.	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF MS. HELEN BLOOM	
	I'm Helen Bloom, and I come as a citizen of Savannah. The Draft of the EIS makes for very scary reading.	
CR-1	In addition to the continuing concern about the contamination of drawn water, about the adverse impact on one thousand-plus acres of wetland, and because of the discharge of thermal effluents, about the deterioration of the Savannah River and the surrounding atmosphere, and the questions on the safe disposal of the high-level waste, there are other areas of concern regarding the Savannah River Plant L-Reactor.	DOE will comply with all applicable Federal and state requirements concerning environmental protection. Section 4.1.1.5 of the EIS compares liquid effluent chemical loads with the corresponding water-quality or drinking-water standard and with concentrations measured in Steel Creek and in the Savannah River above and below the SRP. Available measurements from the Savannah River indicate little variation in measured quantities between upstream and downstream locations from present SRP operations; L-Reactor operation is not expected to alter this situation significantly. As stated in Section 4.1.1.6 of the EIS, the operation of L-Reactor will not violate any ambient air-quality standard. L-Reactor thermal effluent impacts in the river for the reference case are expected to be small; a zone of passage for anadromous fish and other aquatic organisms will exist in the river. The thermal impact to wetlands for the reference case is expected to be similar to conditions that occurred during earlier L-Reactor operation. About 1000 acres of wetlands will be affected over a number of years of reactor operation from the reference case thermal discharge. The impacts on wetlands are described in Section 4.1.1.4 and mitigation alternatives are described in Section 4.4.2 and Appendix I of the EIS. Also see the response to comment AA-1 regarding cooling-water mitigation measures. The volume of high-level radioactive waste to be generated by chemical processing of L-Reactor material was considered in the Defense Waste Processing Facility EIS (Section 5.1.2.8 of the EIS).
CR-2	By restarting the L-Reactor to produce plutonium in an area where there are already three other nuclear reactors in operation, and another reactor on the way, we may be providing terrorists with an exceptionally attractive target area.	See the response to comment BG-9 concerning terrorist attacks.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	What would be the consequences to the more than half-million people living within the 80 kilometer and beyond the vicinity of the reactors if suicidal-type terrorists cause severe damage to or destroy any one of the five nuclear reactors?	
CR-3	Would it precipitate a chain reaction of nuclear reactor destruction?	An accident at one reactor site would not lead to an accident at another site.
CR-4	And finally, we ought to delay restarting of the SRP L-Reactor to study further the very need for plutonium.	The national policy on nuclear weapons, their deployment, and the need for increased weapons is beyond the scope of this EIS.
	Just a few days ago Dr. Carl Sagan and Paul Erhlich, representing the views of many scientists and biologists, have said the latest scientific findings indicate that the United States by itself already has, and in fact has had for several years in its nuclear power arsenal, enough nuclear power armament to destroy all life on earth.	
	Thank you.	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF ANDREAS NISSEN	
	I have read from the Draft Environmental Impact Statement, and I am not satisfied with the safety and environmental protection measures in place at the Savannah River Plant. Because many people do not have the technical expertise to determine from that document the damage that will be done to the communities surrounding the Savannah River Plant, I would like to point out something in a very nonsensical way, a down-to-earth way. Insurance companies are some of the largest and most successful institutions in the world. They got that way by professionally assigning risks. For instance, they do not ensure people with bad driving records. They do not ensure hazardous dwellings, or they do not ensure suicidals.	
CS-1	They also will not ensure nuclear facilities, such as the Savannah River Plant. Does this not indicate that these plants must be made safer? It does to me.	An insurance pool in the United States currently provides $160 million of liability insurance for commercial nuclear facilities and nuclear materials transportation in addition to insurance they offer to cover property damage to the facilities themselves. Individual private insurance policies (such as homeowners policies) usually exclude "nuclear damage" because that is covered on essentially a "no-fault basis" by the liability insurance described above. The Federal government is financially responsible for damage caused by its operations.
CS-2	In Savannah River Plant's case, we, the citizens who live here, as has already been stated by several speakers, we need a proper containment dome. We need adequate effluent water decontamination and cooling devices, and because of past experience with nuclear accidents, we need an independent oversight committee to act as a watchdog over this extremely hazardous facility. Thank you for allowing me my comments.	See the responses to comments AA-1, AA-3, and AB-13 regarding cooling-water mitigation alternatives and DOE's commitment to comply with applicable Federal and state environmental protection regulations, the response to comment BF-7 regarding containment, and the response to comment BQ-2 regarding existing oversight mechanisms.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF MR. JOHN MACLEAN	
CT-1	My name is John Maclean, and I'm speaking for myself. I have several points, the first being that I have waded through the EIS and "waded through," I think, is the appropriate description, and among several of the facts that I found were not clarified or clear to me were the percentages of cancer deaths that would result from the startup of the L-Reactor and also the percentage of the mutations or deformities in children being born in the area, within the 80-mile area, of the Aiken plant. The rates, as stated in the EIS, were three per thousand cancer deaths and four per thousand for deformities. The problems with these rates is that, if, in fact, they are true, you are talking about a city, say, for example, Savannah, of 100,000 people, you would be talking about 300 people per year dying of cancer because of the L-Reactor or 400 people per year having deformities when they are born, because of the L-Reactor. These levels, of course, are unacceptable. It would be hard to tell your wife or child that they were being sacrificed for the L-Reactor. I think, in fact, that these figures are wrong, that what you mean to say -- I hope you mean to say -- that it's three per thousand, or .003 excess cancer deaths above the ones that you would normally have. The problem is that is not spelled out in the EIS. I think you have to clarify that. It would certainly ease my mind if you would clarify that so that I don't leave the permanent EIS, thinking that I'm going to see my wife or child suffer because of the L-Reactor. I can't believe that the percentages are that high, and I think this should be clarified because it's not clear in the EIS.	The calculated potential excess cancer fatalities and genetic disorders (not the percent of increase) are presented in Section 4.1.2.6 for L-Reactor operation, in Section 5.1.2.5 for support facilities, and in Section 5.2.7 for all nuclear facilities within 80 kilometers. The increased incidence of health effects is expressed in terms of effects (cancer or genetic effects) per 1,000,000 person-rem. The risk estimator factors used in the EIS were 120 cancers and 257 genetic effects per 1,000,000 person-rem. The potential health effects from L-Reactor operation are much less than one excess cancer fatality and much less than one genetic disorder for the entire population living within 80 kilometers of the Savannah River Plant. The pertinent sections of the EIS have been rewritten to clarify how the calculations of health effects were determined. To summarize, the potential health effects from L-Reactor operation are much less than one excess cancer fatality and much less than one genetic disorder for the entire population living within 80 kilometers of the Savannah River Plant.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
CT-2	The second point I would like to make is that in the alternatives discussed for the production of plutonium, weapons grade plutonium, one of the alternatives, that being using commercial waste from commercial reactors, is very quickly reviewed and dismissed. It is dismissed because the Atomic Energy Act states that you cannot use commercial waste to make weapons grade or use for military purposes, and therefore, with one sentence, you state in the EIS that this alternative is not feasible. The problems with that is you have spent two hundred-some-odd million dollars. We have rented a room, in four other different places, time and time again, and we have booklets, and we have people with all that money, and with President Reagan stating that, as a matter of policy, and I'm quoting now from Page S-1 of the EIS: "As a matter of policy, national security requirements, not arbitrary constraints on nuclear material availability, shall be the limiting factor in the nuclear force structure." It seems to me that, as a taxpayer, I would like to save my 200 million dollars, and I think that President Reagan's attitude would certainly help the DOE in simply amending the Atomic Energy Act so that you can in fact, use the commercial waste to make plutonium that you need. If you were able to do that, you would be able not to have the L-Reactor. You would not have any problems with cooling towers, you would have any questions about containment domes because you wouldn't be having a reactor. Instead, you would be taking the commercial waste that is being built up and that nobody has any idea what they are going to do with. You can take it straight from a commercial reactor, take it over to either Barnwell or take it to the L-Reactor chemical separator itself and go ahead and process it. You are going to have to cook it longer because you are going to have higher degree of Plutonium 240, but you can do it, and you can do it and save all this money, and all you have to do	See the response to comment BY-2 regarding the use of material from commercial reactors. Additional information on this subject has been added in this final EIS in Section 2.1.1.2.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	with one stroke of a pen is amend Atomic Energy Act, and bingo, you have got it. I think that alternative should be considered a lot more than it has been, and certainly should have been considered before the 200-some-odd million dollars was spent, and I believe the DOE should at least really look to its own lobbyists to try to get that act amended because that would solve everybody's problem. It would help the commercial people getting rid of their waste, and it would help us down here because we wouldn't have a reactor. It would just solve a lot of problems.	
CT-3	The last point is about the cooling tower. The cooling tower would take about 39 million dollars to build. You can build it now and also keep the L-Reactor on line and on time, and in the 18 months that it would take to build it, you could simply cut it in. Your own EIS states this is an alternative. You can build it and cut it in, and you won't lose any time or any plutonium because the L-Reactor would be on line. I think that is an alternative that everyone can live with. I think it's a good compromise. People down here get their cooling tower and the L-Reactor, and the DOE gets their plutonium, all at the same time, and I don't think 39 million dollars is all that much to spend, considering you have already spent 200 million dollars, and considering it's just a drop in the bucket of the deficit. So I think those three things, clarification of the cancer and deformity rates, genetic disorder rates, should be made clear in the permanent EIS, and I think the alternative of amending the Atomic Energy Act should be discussed a little further than it has been, and, thirdly, the alternative of the cooling tower being built and then being cut in while the L-Reactor is already on line, I think, it is a good alternative and should also be further discussed. Thank you.	See the responses to comments AA-1 and AB-13 regarding cooling-water mitigation alternatives.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF MR. SPRAGUE	
	My name is Larry Sprague, and I'm speaking for myself. There are several specific questions that I believe should be addressed or addressed more fully by the Environmental Impact Statement.	
CU-1	First off would be the dosage tables, particularly, that are found in Exhibit 4-25, and this is the dosage table that shows the amount of dose of radiation that people outside of the Savannah River Plant might receive. The EIS does not make clear how these figures were arrived at. For instance, were they historical measurements of radiation coming from the L-Reactor? Well, if this is so, then, from my reading of the EIS, it seems that the measuring instruments were on the perimeter of the plant site and therefore, the concentration of radiation would be very slight and very difficult to monitor or detect accurately. Furthermore, the measuring instrument was a thermoluminescent dosimeter, or TLD, for short, which is a relatively insensitive instrument for measuring some type of radiation. Therefore, the cumulative dosage could, in fact, be higher than the table indicates. Furthermore, what standards of maximum dosage will be used? The EIS indicates that the limits will be per DOE regulations. However, I would like to make two points on that. One, in the EIS nowhere are the DOE regulations set out, so the public can have an idea of what the difference is between the NRC regulation and the DOE regulation, and secondly, if the DOE regulations allow a higher dosage than those found in 10 CFR 50, why is that so? Why is it that the DOE deems it all right for the surrounding community to be subjected to this higher level of dosage on the DOE regulations than under 10 CFR 50?	Exhibit (Table) 4-25 in the Draft EIS presents the environmental risk from a hypothetical 10-percent core-melt accident. Section 4.2.1.5 presents the method of calculating this risk. These calculated values are the product of dose consequence and probability per year for the accident. Table 4-22 in the Draft EIS lists the offsite doses from credible accidents. These doses are less than the DOE standards for normal operations (DOE 5480.1a., Chapter 11), which are essentially the same as those used by NRC for regulating the nuclear power industry (10 CFR 20). The dose from a range of accidents is treated probabilistically and compared in Figure 4-11a of the Draft EIS with the NRC design goal for power reactors (10 CFR 100) of 25 rem at the site boundary. The offsite doses from L-Reactor operation (Table 4-19 in the Draft EIS) are based on the average releases of radioactivity for 1978, 1979, and 1980 for the operating C-, K-, and P-Reactors. The releases of radioactivity from these reactors are measured at the point of release to the environment. All radionuclides released are measured quantitatively by a system that includes continuous monitoring plus sampling and analysis in analytical laboratories. The environment is comprehensively monitored by a program described in Section 6.1 of the EIS. This program includes sampling and analysis of drinking water, rainwater, river water, food, fish, vegetation, animals, soil, etc. During normal operations, tritium is the only radionuclide of SRP origin that is detectable in environmental samples by routine monitoring techniques. Thus, it is necessary to calculate offsite doses by a model that accounts for movement of radioactivity in the environment and exposure of man by

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
		known exposure pathways. This environmental dosimetry model is described in Appendix B of the EIS. The expected releases of radioactivity from L-Reactor given in Sections 4.1.2.1 and 4.1.2.2 was used to calculate the offsite doses shown in Table 4-19 of the Draft EIS.
CU-2	My second point has to do with the radiocesium found in Steel Creek. I understand that the original source of the cesium was from a leak in the primary cooling system to the secondary cooling system. I would like to see in the EIS what has been done to prevent a recurrence of this. In particular, I believe the following steps should be taken. First, a radiation detector should be put in the secondary cooling system to determine when, in fact, you do have a leak, and not only that, but it should indicate present radiation and shouldn't just be detecting cumulative amounts. Secondly, the secondary cooling system should be a closed loop with a demineralizer in it, so that in the event of a leak, the reactor can be operated for a while without the radiocesium being admitted into the environment. Third, a third loop in the cooling system should be added.	As discussed in Section 3.7.2.1 of the EIS, the primary source of radiocesium was leaking fuel elements stored in the disassembly basins in P- and L-Areas, not a leak in the primary cooling system. See Section 3.7.2.1 of the EIS concerning steps taken in the late 1960s and early 1970s to reduce further releases of radiocesium. Also see Sections 2.2.3 and G.3.1.5.3 of the EIS concerning radioactivity monitoring of the secondary cooling water discharged from the reactor heat exchangers. A closed second cooling loop with demineralizer or a third cooling loop is not necessary because the primary loop is continuously deionized and filtered and leakage between the primary and secondary loop is small. Leakage between the primary and secondary loops is continuously monitored and limited to a value that would result in a radiological release that is only a small fraction of acceptable release limits. Should this limit be exceeded, operating procedures require that the reactor be shut down and the heat exchanger be isolated to prevent further leakage. The radiological impact of leakage is a small fraction of the impact of total reactor wastewater discharges to the process sewer, which are well within acceptable limits.
CU-3	My third area of concern is metal fatigue of the reactor vessel. Radiation over a period of time can lead to metal fatigue in the area of the highest neutron influx in the reactor vessel. Now, this reactor vessel was actually in operation for about 12 years. I would like to see this question addressed: First, what is the effect that this has had on the strength of the reactor vessel; have any studies been done, and what are their conclusions; and if no studies have been done, why not?	The effects of neutron irradiation on the stainless steel SRP reactor vessels have been studied (Extended Service Life of Savannah River Plant Reactors, D. A. Ward, et al., DPST-80-539), and it has been concluded that no significant deleterious metallurgical effects have occurred. Furthermore, no future deleterious effects are expected because neutron fluence has been accumulating very slowly since operation with lithium-blanketed charges started in 1968. At the temperatures and

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
		neutron fluences experienced by SRP reactors, yield strength and tensile strength increase; ductility and impact strength decline with increasing neutron fluence. The temperature of the SRP reactor tank walls is too low for significant swelling to occur from voids or gas bubbles resulting from neutron irradiation. In addition, experimental evidence has demonstrated that a relaxation of preirradiation stresses also results from fast neutron fluence. The reactor tanks are not expected to be affected by fatigue damage because the stresses encountered in the low-temperature, low-pressure system are well below endurance limits, and vibration from process-water circulation has been reduced to a low level.
CU-4	Lastly, I would like to take the DOE to task for the lateness of the Environmental Impact Statement. I realize this is somewhat futile, but it does upset me to see the whole purpose of the Environmental Impact Statement defeated. The whole purpose is for the federal government, before it spends huge sums of money, to take a look at all the facts and possibilities. Well, the government has already spent the money. It has already spent around 200 million dollars. What do we have? A plant that is supposed to produce plutonium, but it is not in operation. It hasn't produced one ounce. Part of the reason is because you haven't produced an EIS, but secondly, there are still serious questions raised about its safety, and these questions could have perhaps been answered, and the answers to these questions incorporated in the rebuilding of the L-Reactor and perhaps the L-Reactor would be in business today, or alternatives such as the Barnwell plant could have been chosen, and three years ago, it might have been possible to amend the Atomic Energy Act and thereby use the Barnwell plant. So, if instead of ramming the L-Reactor down our throats, the government had gone ahead and done an EIS, which was almost self-evident on its face that they had to, and the other alternatives looked at, the L-Reactor might have been made safer in the first instance, might be in operation now, because it was safer, and all these problems would have been taken care of and we wouldn't be under the time constraints we are now, or possibly a cheaper and safer alternative, such as the Barnwell plant, might have been possible. Thank you.	This EIS has been prepared in accordance with the Energy and Water Development Appropriations Act, 1984, and the National Environmental Policy Act of 1969, as amended. The potential environmental consequences of upgrading and renovating L-Reactor--as opposed to operating L-Reactor--were reviewed and determined to be insignificant.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF PAUL S. DRAPER, L. R. CASTILIAN, LOUISA GREEN, RANDY (CHILL), A. L. WEEKS, CHARLES H. RAWLINSON, THOMAS M. COMBS, STEVE HIERS, WILLIAM OLIVE, JOHN GRIFFIN AND CECIL PRYOR	
CV-1	It is our opinion that the L-Reactor should not be reactivated until further ecological studies have been made.	The EIS included comprehensive ecological information drawn from more than 100 documents developed over the past 30 years by recognized research organizations (the Savannah River Ecology Laboratory, the Savannah River Laboratory, the Academy of Natural Sciences of Philadelphia, the U.S. Geological Survey, and the University of South Carolina, among others). Extensive ecological studies, both onsite and offsite, are described in Sections 3.6, 4.1.1.2, 4.1.1.4, 4.4.2, 5.2.4, 5.2.5, Chapter 6, and Appendix C. For example, the Academy of Natural Sciences of Philadelphia has monitored the water quality and aquatic biota of the Savannah River for the past 30 years; also, an intensive comprehensive cooling-water study (Section 6.1.3) is monitoring water usage and quality, and wetland, fisheries, and endangered species impacts in Par Pond, the SRP onsite streams, the Savannah River swamp, and the Savannah River from Augusta downstream to near Savannah, Georgia. Section 7.3 of this EIS has been revised to reflect the current status of consultations with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	LETTER OF ARTHUR H. DEXTER	
	Rt. 1, Box 80A Aiken, S.C. 29801 November 4, 1983	
	Mr. M. J. Sires, III Assistant Manager for Health, Safety and Environment U.S. Dept. of Energy Savannah River Operations Office P.O. Box A Aiken, S.C. 29801	
	Dear Mr. Sires:	
	I was disappointed to find that the Draft EIS had failed to treat, in a technically honest manner, the concerns that I raised in my letter of August 3, 1983. I offer the following additional comments:	
CW-1	1) The Draft EIS fails to cite the technological breakthrough that now permits the ultra-conservative assumption that core melting can be limited to 1% (or is it 3%?) of the fuel. During the several years that I was associated with these concerns, it was commonly assumed that fuel melting would be so extensive that the fuel would melt through the bottom of the reactor tank and come to rest in the pin room, i.e., the room immediately beneath the reactor. That scenario was obviously closer to 100% meltdown than to 1%.	See the responses to comments BL-2 and BL-4 regarding loss-of-coolant accidents.
CW-2	2) I find it curious that the Draft EIS chooses to ignore the research that A. G. Evans and I performed which shows that essentially 100% of radioiodine is released in the volatile form, from water in the presence of a background of ambient radiation. The Draft EIS contention, that the radioiodine would stay dissolved in the water, is completely at odds with these findings.	In analysis of loss-of-coolant accidents resulting in fuel damage, 50 percent of the iodine in the damaged fuel is assumed to become airborne within the process room (see Section 4.2.1.4). No credit is taken for condensation on various building structures and all of the airborne iodine is assumed to reach the carbon filters of the airborne activity confinement system. The remainder of the iodine would be contained in

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	It is interesting that while the EIS tries on the one hand to outdistance itself from commercial power reactors when matters pertaining to containment vessels are discussed, it is quick to cite TMI-2 results on radioiodine, (which may or may not have any application to SRP), in preference to in-house results! This matter of the volatility of the iodine, in the presence of ionizing radiation, is a very critical concern as regards the safety of CSRA residents. Obviously the framers of the EIS do not wish to acknowledge that radioiodine is released from the water since this would be an acknowledgment of the contentions of my letter and the inadequacies of present SRP measures for dealing with a meltdown accident.	the reactor, reactor building, moderator, or emergency cooling water. Moderator and emergency cooling water containing radioactivity would be retained in two tanks as discussed in Section 4.2.1.4. Only a small fraction of radioiodine in these tanks would be volatilized. The tanks as originally designed were vented to the atmosphere but were subsequently modified to vent back through the airborne activity confinement system so that no unfiltered radioiodine compounds would be released. The research referred to in the comment is applicable to volatilization of iodine from these tanks. The purpose of the research was to investigate the use of additives to prevent or retard volatilization of iodine from water in the presence of a radiation field. The results of their research were published (A. H. Dexter et al., 1977, "Iodine Evaporation from Irradiated Aqueous Solutions Containing Thiosulfate Additive," 14th ERDA Air Cleaning Conference) and do not support the statements made in this comment. The research showed that after exposure to 10^8 rads, 14.6 percent of the iodine was evaporated with no additives, some additives increased evaporation up to 96 percent while other additives were found to reduce evaporation to as low as 0.044 percent. After modifying the tanks to vent them to the confinement system, concerns regarding volatilization of iodine from the tanks were alleviated.
CW-3	3) I am frankly skeptical about the Draft EIS claim that SRP has developed impregnants that will permit the absorption of organic iodide compounds on carbon. If such is the case, then a major breakthrough of this kind should be extensively documented in the EIS.	Appendix B of the EIS describes the effectiveness of the impregnated carbon filters. The references listed in this appendix, especially the Safety Analysis Report (Du Pont, 1983), contain more details.
CW-4	4) While the Draft EIS fails to provide a technically honest treatment of the concerns raised in my previous letter, I suggest that the 50-million gallon basin is, in effect, a "smoking gun" in that its very existence is confirmation of the scenario that I cited in my letter: It is there to receive the huge volumes of radioactively contaminated cooling water that will flow to it during the aftermath of a *meltdown. There is no other reason for the existence of* this 50-million gallon basin. Lest anyone should experience difficulty in envisioning the volume of this huge	Section 4.2.1.4 describes the design functions of the 225,000-liter underground tank, the 190-million-liter emergency earthen basin, and the 1.9-million-liter tank in the earthen basin. This system was designed to contain radioactive materials resulting from accidents ranging from a spillage of the moderator to fuel melting. See the response to comment BL-4 for further discussion of loss-of-coolant accidents.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	basin, an equivalent basin could be created by excavating a regulation football playing field to a depth of 129 ft.	
	Sincerely,	
	Arthur H. Dexter	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF R. EILEEN BULLER	
	October 27, 1983	
	Mr. M.J. Sires, III Assistant Manager for Health, Safety and Environment U.S. Dept. of Energy Savannah River Operations Office P.O. Box A Aiken, S.C. 29801	
	Re: DOE/EIS 0108D	
	Dear Sir:	
	I have completed reviewing the above EIS and wish to have my comments entered in the public record. Living on the edge of the Hanford Nuclear Reservation with its N-Reactor operations, I have developed some strong opinions about such facilities.	
CX-1	First, I believe that containment domes should be installed on all reactors. The possibility of accidental release is of great concern. To argue that such a containment is not cost effective ignores that well known fact (per Three Mile Island) that accidents do happen. All commercial reactors are required to have this design and it is reasonable to want military reactors to have the same.	See the response to comment BF-7 regarding containment domes.
CX-2	Secondly, the closed loop design with its direct discharge into rivers must be stopped. If it were not for the extensive lobbying efforts of two of Washington state's Senators long ago, the hot discharge into the Columbia would not have happened. I believe that this practice must be stopped.	See the responses to comments AA-1, BM-3, and CP-2 regarding cooling-water mitigation alternatives.
CX-3	Thirdly, these DOE managed facilities lack independent oversight when it comes to safety and health. It is imperative that our government restructure this inadequacy and apply independent oversight. The GAO Report on DOE managed facilities showed glaring mistakes at all facilities continually over the past years of operation. That report should be used as further	See the response to comment BQ-2 regarding existing oversight mechanisms. In DOE's comments on the GAO report (which had not been provided by GAO to DOE for review prior to publication), it was indicated that the "...GAO fundamentally misunderstood the

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	evidence that the public needs better protection and cannot rely on present DOE management to provide it.	philosophy of DOE's approach to safety and health, and failed to recognize the positive results of this approach." Also, "...many of the specific examples used to support GAO's recommendations were taken out of context, were inaccurate or reflected a misunderstanding of DOE's approach to its Safety and Health Program." These comments, which were provided to Congress on October 7, 1981, also identified the following points, which refute the GAO contentions: o Although not regulated by the Occupational Safety and Health Administration (OSHA), the DOE Health and Safety Program historically has resulted in a much better safety record for DOE facilities than the total OSHA-regulated industries or similar industries regulated by OSHA, such as the chemical industry. o Having health and safety as a line management responsibility ensures clear lines of authority in implementing health and safety requirements, assures that health and safety is an integral part of each program and is properly considered in all phases of a program, assures that the greatest expertise on a specific program is brought to bear on health and safety matters, maximizes the sensitivity of all program personnel to health and safety requirements, and permits utilization of health and safety performance criteria in assessing and motivating program personnel. o DOE provides an effective, independent health and safety overview function through the Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness, who is a Presidential Appointee and who has no nuclear program management responsibilities. o DOE, as part of its continuing internal efforts to improve and strengthen its Health and Safety programs had initiated modifications to improve its programs as a result of the internal evaluation published in March, 1981. This was not taken into consideration in the GAO report.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
		o The GAO report failed to identify important disadvantages of potential NRC regulation of DOE facilities including the fact that NRC expertise is primarily with high-pressure light-water cooled reactors as opposed to the low-pressure, heavy-water production reactors at SRP for which the main expertise resides in DOE. In summary, the GAO report does not provide a balanced review of DOE Health and Safety programs, and the effectiveness of these programs relative to those regulated by such agencies as OSHA is demonstrated by the excellent safety record as compared to records for regulated industries engaged in similar activities.
	The thought of further contamination at Savannah River by bringing up the L-Reactor is most distressing. Although I live in Washington, I know how it feels to be at the whim of the DOE and its well-paid contractors. Past mistakes of handling waste, of leakers, of direct river contamination, of slowly moving plumes of tritium and other isotopes into the river and aquifers all evidence that this decision is incorrect. It is time to clean up 40 years' worth of enormous contamination, not to produce more waste. Reprocessing is a filthy process and the health and safety of all of us should be of paramount concern.	
CX-4	Finally, the need of the L-Reactor is in question. From my knowledge of new programs at Hanford such as the Laser Isotope Separation Process and the modification of the head-end of the PUREX plant, it appears that plutonium production is not being neglected and certainly does not need additional L-Reactor product.	See the response to comment AB-8 regarding need. Construction of a shear-leach head-end on the PUREX facility is discussed in this EIS in Section 1.1.2 and Appendix A.
CX-5	If tritium is needed, and I doubt we need any plutonium bombs at all, then use the N-Reactor. These pro-nuclear advocates at Hanford would delight in that thought, as their built-in pork barrel would be guaranteed. By doing this, the N-Reactor's life would be shortened much to my delight. Yours truly, R. Eileen Buller, 1703 West 15th Ave., Kennewick, WA 99336	The need and production of tritium is outside the scope of this EIS. The purpose of the L-Reactor restart is the production of plutonium.

Comment number	Comments	Responses

STATEMENT OF MAXINE M. WARSHAUER

3526 Boundbrook Lane
Columbia, S.C. 29206
Nov. 1, 1983

Mr. Melvin J. Sires, III
U.S.D.O.E.
S.R. Operations Office
P.O. Box A
Aiken, S.C. 29801

Dear Mr. Sires:

I would like to submit a personal comment for the Environmental Impact Statement concerning the L-Reactor at SRP. As a South Carolina resident, I am concerned with the effects of

CY-1 re-starting the L-Reactor. I understand that the water to be discharged into Steel Creek is hotter than state safety regulations allow. Flushing cesium into the Savannah River would contaminate drinking water downstream. Furthermore the seepage basins would leak more toxic chemicals into the Tuscaloosa aquifer. And high-level toxic wastes produced at SRP would be raised by 33%.

I am opposed to re-starting the L-Reactor until these environmental hazards can be effectively neutralized.

Yours truly,

Maxine M. Warshauer

See the response to comment AA-1 regarding cooling-water mitigation alternatives, the response to comment AA-2 regarding the relationship of radiocesium and radiocobalt concentrations to EPA standards, and the response to comment AJ-1 regarding ground-water and seepage basins.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

STATEMENT OF FRANK VON HIPPEL

Princeton University School of Engineering/Applied Science
Center for Energy and Environmental Studies
The Engineering Quadrangle
Princeton, New Jersey 08544
Phone (609) 452-5445

October 31, 1983

Mr. M. J. Sires, III
Assistant Manager for Health,
Safety and Environment
US Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, SC 29801

Dear Mr. Sires,

Please find attached my comments on the Draft Environmental Impact Statement, L-Reactor Operation, Savannah River Plant (DOE/EIS-0108D).

Sincerely yours,

Frank von Hippel

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	November 1, 1983 Comments on the Department of Energy's Draft Environmental Impact Statement on L-Reactor Operation, Savannah River Plant (DOE/EIS-0108D) Frank von Hippel Princeton University Summary Because of time constraints, these comments are limited to the treatment in the Draft EIS of: o the risk from reactor accidents, and o the need for additional weapons-plutonium.	
CZ-1	With regard to the risk from reactor accidents, the final EIS should include an estimate of the consequences of a full-core meltdown followed by a failure of the radioactive gas filtration system. Accidents of this severity are routinely considered in the Nuclear Regulatory Commission's (NRC) risk analyses for civilian power reactors. The DOE's belief that such catastrophic accidents are impossible at the L-Reactor may be due to the apparent neglect of common-mode failures in its accident probability estimates. Since, in any case, such probability estimates are known to be unreliable as predictors of the likelihood of catastrophic accidents at nuclear reactors, the DOE's risk assessment should focus principally on the degree of "defense-in-depth" designed into the L-Reactor's safety systems. From this perspective, the lack of a passive containment building, a standard safety feature of all US civilian power reactors, must be a source of serious concern.	As discussed in Section 4.2.1.3, the airborne activity confinement system is assumed to operate for all accidents considered because of its high reliability and the extremely low probability of a concurrent accident and system failure. Section 4.2.1.4 of this final EIS has been modified to present the basis for the probability criteria used to select accidents for further analysis including those caused by common mode failures. Since startup of SRP reactors, a continued effort has been devoted to the to the review of the effectiveness of reactor safety systems and upgrading of systems. These reviews have included analysis of what has come to be known as "common cause" failures as noted in the response to comment BL-9.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
		DOE has focused on the degree of "defense-in-depth" designed into the L-Reactor safety systems by describing these systems and accident experience and analysis in this EIS. Concerns regarding a passive containment building for the L-Reactor are addressed in Section 4.4.1 of this EIS as well as in its detailed description of the benefits of the alternate confinement system in Section 4.2.1. Also see the responses to comments BF-6, BF-7 and BL-11 concerning the adequacy of the L-Reactor confinement system.
CZ-2	With regard to the need for the L-Reactor plutonium, the unclassified discussion offered in the Draft EIS is unnecessarily vague. *Essential information has been omitted despite the* fact that this information has previously been made public or is easily derivable from public information. Such information, which should appear and be discussed in the final EIS includes: the approximate amount of plutonium already in the US nuclear weapons stockpile, the approximate plutonium production rate of the L-Reactor, and the amount of plutonium in the Nagasaki bomb. The reader of the unclassified EIS would learn from these three numbers that the plutonium already in the US nuclear weapons stockpile is sufficient to make at least 20,000 nuclear warheads and that the L-Reactor would increase this stockpile by only about 0.4 percent a year. These facts are certainly relevant to the L-Reactor restart decision and indeed make implausible assertions that plutonium shortages could delay the deployment of any high-priority US nuclear weapon systems. To further clarify the matter, the DOE should include in the final EIS a list of the weapons systems which it believes would be delayed if the restart of the L-Reactor were postponed or cancelled.	See the response to comment AB-2 regarding information in this EIS on need and production alternatives. The national policy *on nuclear weapons, their deployment, and the need for* increased weapons is beyond the scope of this EIS.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	Reactor Accident Consequences People living near the Savannah River plant are entitled to know the potential consequences of a worst-case accident at the L-Reactor. Furthermore, frankness and honesty about this possibility is likely to be in the long-term interests of the government. The traditional AEC-ERDA-DOE public-relations approach to concerns about reactor safety has not done civilian nuclear power any good in the past and is unlikely to do the nuclear weapons production complex any good in the future. More often than not, such a policy seems to backfire and convinces concerned citizens that the risks are greater than they really are.	
CZ-3	The worst-case accident at the L-Reactor would be a full core meltdown with the radioactive gases driven off by the core escaping unfiltered to the human environment. Although the DOE may believe that such an accident has a negligible probability, it is well-known that such probability estimates are unreliable.	See the response to comment CZ-1 and the response to comment BL-12 regarding probability estimates.
CZ-4	The unreliability of estimates of the probabilities of catastrophic nuclear reactor accidents became clear as a result of the many review of the Nuclear Regulatory Commission's Reactor Safety Study (RSS). This study included estimates of the probabilities of catastrophic accidents at two civilian nuclear power plants. The work underlying these estimates was both much more sophisticated and more complete than the L-Reactor risk assessment described in the Draft EIS. Nevertheless, following a prolonged debate and a commissioned outside review by a group on which I served, the NRC concluded in 1979 that "the Commission does not regard as reliable the Reactor Safety Study's numerical estimate of the overall risk of reactor accident." [NRC Press Release, January 18, 1979.]	The probability estimates for the L-Reactor are not derived from those developed for the Reactor Safety Study, WASH-1400, although the basic methodology is similar. However, it should be noted that the Risk Assessment Review Group found in part: "o Despite its shortcomings, WASH-1400 provides at this time the most complete single picture of accident probabilities associated with nuclear reactors." And, "o The Commission accepts the Review Group Report's conclusion that absolute values of the risks presented by WASH-1400 should not be used uncritically...." DOE has not used the probability estimates uncritically.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
CZ-5	A measure of the incompleteness of the L-Reactor risk assessment is the fact that it does not even include accident scenarios which could lead to a full core meltdown with failure of the radioactive gas filtration system. In the RSS, such catastrophic accidents were estimated to have a much higher probability (30 times higher for a pressurized water reactor) than the probability given in the Draft EIS for the most severe L-Reactor accident considered there (a relatively benign event involving the melting of only 3 percent of the core with the radioactive gas filtration system effectively preventing a large release of radioactivity to the atmosphere - see Table S-2 of the Draft EIS). Although the probability estimates in both reports must be considered unreliable, the absence in the L-Reactor risk analysis of an accident sequence which would lead to a catastrophic release requires explanation.	See the responses to comments BL-1, BL-2, BL-4, CZ-1, and CZ-4 regarding consideration of a full core meltdown.
CZ-6	The most likely explanation for the missing catastrophic accidents in the L-Reactor risk assessment is not the relative safety of the L-Reactor design - which after all does not even have the passive radioactive gas containment building required at all civilian reactors - but the apparent neglect in the L-Reactor risk assessment of "common-mode" safety system failures. This is the class of failures which would include accident sequences which would simultaneously incapacitate all the L-Reactor emergency cooling systems and the radioactive gas filtration system. It is well-known, from both the RSS and accident experiences such as those at Brown's Ferry and Three Mile Island, that common-mode failures are the most likely cause of catastrophic reactor accidents. A severe earthquake; errors in design, construction or maintenance; and sabotage are only some of the many potential causes of such common-mode failures which should have been considered.	See the response to comment CZ-1, and the responses to comments BL-9 and BL-12 regarding "common mode" failures.
CZ-7	In any case, in the final EIS, the DOE should discuss the consequences of a core melt-down at the L-Reactor with subsequent bypass or failure of the radioactive gas filtration system. As I show below, the seriousness of such accidents can be estimated from results obtained by the RSS.	See the response to comment CZ-1.
CZ-8	For simplicity, I will consider below only radiation doses at a distance 12 km (7.5 miles) downwind from a worst-case L-Reactor	It is not reasonable to apply the results of the Reactor Safety Study to L-Reactor because of the significant differences in

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	accident. This is the average distance from the L-Reactor to that part of the site boundary which lies to the south of the reactor (see Fig. 3-2 of the Draft EIS). According to Table B-1 of the Draft EIS, the wind blows in these directions approximately one half the time. The predictions of the Reactor Safety Study whole-body and thyroid doses as functions of downwind distance may be found in the NRC report, Examination of Offsite Radiological Emergency Protective Measures for Nuclear Reactor Accidents Involving Core Melt (NUREG/CR-1131, 1978). It is reasonable to compare these results directly to those in the Draft EIS because the thermal power of the pressurized water reactor considered in the Reactor Safety Study (3200 MWt) is approximately the same as that assumed by the DOE in calculating the consequences of L-Reactor accidents (3000 MWt, according to Table S-2 of the Draft EIS). The accumulation of long-lived fission products in the L-Reactor core is somewhat lower than in a power reactor, but, as is shown in Fig. VI 13-1 of the RSS, the most important contributors to the 2-hour offsite dose are short-lived isotopes which would be present in comparable amounts of the two reactors. (The radioactive inventory assumed for the L-Reactor core is given in Table G-10 of the Draft EIS. That assumed for the pressurized-water power reactor considered in the RSS, is given in Table VI 3-1 of that report.)	design. See the response to comment BF-7 regarding these differences.
CZ-9	Given a 10 mph wind and a 3 hour delay before evacuation, the RSS calculated a "mean projected whole body dose" outdoors, 12 km downwind from a core-melt-containment-failure accident of approximately 10 rems. (See curve E of Figure 5.9 of NUREG-CR-1131.) The corresponding thyroid dose was estimated to be about 1000 rems [Ibid, Fig. 5.12]. These numbers are respectively 25 and 2000 times higher than the largest values shown in Table S-2 of the Draft EIS for the 2-hour whole-body and thyroid doses. Doses of this magnitude would not be associated with a large risk of early death from radiation illness, but they would bring with them a significant increase	Based on the doses presented in the comment from a catastrophic accident, the individual so exposed to 10 rems would suffer an average increase in likelihood of death from cancer from about one in five to about 1.01 in five, equivalent to the risk from smoking 1/2 a cigarette per week for 30 years, hardly a "significant increase in cancer risk over the longer term." Similarly, a 1000 rem thyroid dose would yield a total risk of thyroid malignancy in the order of one in 250, with a negligible risk of fatality, a comparatively low consequence of a very low probability accident categorized as "catastrophic."

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	in cancer risk over the longer term. Furthermore, if evacuation were delayed or the meteorological conditions were adverse, whole-body doses could rise above the levels (200-300 rems) where fatalities from radiation illness would begin to occur [NUREG/CR-1131, Figs. 5.10 and 5.22].	
	Land contamination from atmospheric releases of radioactivity on the scale of the worst accidents considered in the Reactor Safety Study would also be much more severe than for those accidents considered in the Draft EIS. For example, the RSS estimated that, even if techniques existed which could be used to reduce the radioactive contamination of thousands of square miles by 95 percent, residents would typically have to vacate for years areas up to 30 miles downwind from a core-meltdown-containment-failure accident [WASH-1400, Fig. VI 13-27]. In the absence of such effective decontamination techniques, this interdicted area would extend about 100 miles downwind.*	
CZ-10	Not even considered in the Draft EIS are the potential releases of the much larger inventories of radioactive waste elsewhere on the Savannah River site which might occur as an indirect result of an accident at the L-Reactor. What would happen, for example, to the huge inventories of Cesium-137 in the high level waste tanks in the F- and H-areas, if, as a result of radioactive contamination by an accident at the L-Reactor, it became impossible to maintain the cooling of these tanks?**	The waste storage tanks are equipped with cooling coils which are supplied with water from a closed-loop cooling system, which in turn, is cooled by heat exchangers supplied with well water. Loss of cooling in a waste tank containing fresh high-heat waste, a tank with a maximum rate of heat generation, would cause the temperature of the waste to increase to the boiling point over a period of about a week unless corrective action were taken. The maximum sludge and supernate temperature for each waste storage tank is recorded daily so that adequate time would be available to identify a cooling deficiency and to restore full cooling or to initiate supplementary cooling to avoid overheating. In addition to backup cooling water supply, each cooled waste tank is provided with a condenser as a backup for its cooling coils.
	All these consequences should be carefully discussed in the final EIS.	There is presently no known accident that would occur at L-Reactor and cause a concurrent failure of the waste tank cooling system. In addition, the distance to the waste tanks from L-Reactor are sufficiently far that access and all necessary maintenance to the waste tanks would continue to be performed in the unlikely event of an accident at L-Reactor.

*See also Jan Beyea and Frank von Hippel, "Containment of a Reactor Meltdown, Bulletin of the Atomic Scientists, August/September 1982, p. 52.

**See Waste Management Operations, Savannah River Plant, (ERDA, Draft Environmental Impact Statement, ERDA-1537, 1976), pp. III-96 and III-97 for a suggestive although incomplete discussion of the problem of loss-of-cooling in Savannah River high level waste storage tanks.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	The Urgency of Additional Plutonium Production for Weapons	
CZ-11	Although the reactor accident risk assessment in the Draft EIS is obviously inadequate, it is at least accessible for independent peer review and will hopefully be improved as a result. In the case of the claimed need for the L-Reactor plutonium, however, the DOE appears to have used the excuse of classified information to avoid a public critique of its analysis. As will be shown below, it was unnecessary for the DOE to adopt this position. The principal numbers required to judge the need for the L-Reactor plutonium are in the public domain. Furthermore, these numbers tend to cast doubt on any claims of urgency for the restart of the L-Reactor. One can easily estimate, for example, from the published numbers for the quantities of Strontium-90 and Cesium-137 in the accumulated radioactive wastes at the DOE's Savannah River and Hanford sites, how much U-235 was fissioned in the AEC-ERDA-DOE production reactors and therefore how much plutonium these reactors produced. If one does this, one arrives at an estimate of approximately 120,000 kilograms of plutonium in the U.S. nuclear weapons stockpile. One can also easily calculate from the 2350 MWt nominal thermal power of the L-Reactor given in Table G-5 of the Draft EIS that it will be able to produce about 500 kg of weapon-grade plutonium per year - or approximately 0.4 percent of what the U.S. already has in its weapons inventory. Finally, we know from a declassified memorandum from General Groves (dated 18 July 1945) to the then Secretary of War, that the nuclear bomb which destroyed Nagasaki contained approximately 6 kg. of plutonium. This means that, even in the absence of the advances in nuclear weapons technology since 1945,	See the response to comment AB-2 regarding information in this EIS on need and production alternatives. The national policy on nuclear weapons, their deployment, and the need for increased weapons is beyond the scope of this EIS.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	the amount of plutonium currently in the U.S. weapons stockpile would be sufficient to make 20,000 Nagasaki weapons.* The explosive yield of these weapons could, of course, be enormously increased by using them to trigger a second stage thermonuclear reaction. The bare facts above by themselves make implausible that the lack of future plutonium production from the L-Reactor would delay any high priority U.S. nuclear weapons system. The DOE could, however, further clarify the issue by including in the final EIS a list of the weapons systems which it believes would be delayed if the restart of the L-Reactor were postponed or cancelled. Conclusion As a result of the review documented above, I conclude that the DOE has not provided in the Draft EIS an analysis of the quality which should be required for a federal action as significant as the L-Reactor restart decision.	

*The U.S. also has in its nuclear weapons stockpile sufficient highly enriched uranium to make additional tens of thousands of nuclear warheads. The detailed documentation of this fact, along with the estimates given above for the U.S. weapons-