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ENVIRONMENTAL IMPACT STATEMENT SCOPING PROCESS

SCOPING SUMMARY REPORT

**Mixed Oxide Fuel Fabrication Facility
Savannah River Site**

August 2001



U.S. Nuclear Regulatory Commission
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ABBREVIATIONS

ADAMS	Agency wide Document Access and Management System
CAR	Construction Authorization Request
DCS	Duke Cogema Stone & Webster
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ER	Environmental Report
H&S	human health and safety
HEPA	high-energy particulate air
HLW	high-level (radioactive) waste
MINATOM	Ministry for Atomic Energy of the Russian Federation
MOX	mixed oxide
MOX FFF	Mixed Oxide Fuel Fabrication Facility
MT	metric tons
NEPA	National Environmental Policy Act
NAACP	National Association for the Advancement of Colored People
NMSS	Nuclear Material Safety and Safeguards (part of the Nuclear Regulatory Commission)
NRC	U.S. Nuclear Regulatory Commission
NOI	Notice of Intent
ROD	Record of Decision
SER	Safety Evaluation Report
SPD	surplus plutonium disposition
SRS	Savannah River Site
YMP	Yucca Mountain Project

1. INTRODUCTION

On March 7, 2001, the United States Nuclear Regulatory Commission (NRC) issued a notice of intent (NOI) in the *Federal Register* (66 FR 13794) to prepare an environmental impact statement (EIS). As indicated in the NOI, the proposed major federal action requiring the EIS is the construction and operation of a mixed oxide (MOX) fuel fabrication facility (MOX FFF) at the Savannah River Site (SRS) near Aiken, South Carolina. If authorized under the requirements of 10 CFR Part 70, Duke Cogema Stone & Webster (DCS), a contractor chosen by the United States Department of Energy (DOE), would build and operate the proposed MOX FFF. The EIS will examine the potential environmental impacts of manufacturing MOX fuel from surplus weapons-grade plutonium. The potential impacts associated with processing 36.4 tons (33 metric tons (MT)) of this surplus plutonium will be evaluated. The evaluation of these impacts will be based on the proposed maximum annual MOX FFF capacity of 3.5 MT.

Under the present technical review schedule, the EIS will be used to support a decision in 2002 by the NRC whether or not to authorize construction of the proposed MOX FFF. The current schedule is to publish the draft EIS in February 2002. Following a public comment period, the draft EIS would be revised, and a final EIS would be published in September 2002. No cooperating agencies have been identified during the scoping process. NRC, as the lead agency, will prepare the EIS with the assistance of Argonne National Laboratory.

In addition to the EIS for the MOX FFF, NRC will prepare two safety evaluation reports (SERs) on health and safety issues raised by the proposed action. The first SER will evaluate such issues raised by the construction authorization request submitted by DCS in February 2001. A second SER will evaluate health and safety issues raised by the DCS request for authority to operate the proposed MOX FFF, which DCS plans to submit in July of 2002. The SERs document our evaluation of the safety of DCS's applications and compliance with applicable regulations. As discussed later in Section 3, the EIS will analyze both construction and operation impacts.

In the NOI, NRC announced plans for two scoping meetings: one in North Augusta, South Carolina, on April 17, 2001, and another scoping meeting in Savannah, Georgia, on April 18, 2001. In a second *Federal Register* notice on April 11, 2001 (66 FR 18223), NRC announced that a third scoping meeting would be held in Charlotte, North Carolina, on May 8, 2001. Announcements of the meetings were also made on the World Wide Web at the NRC MOX FFF Information Home Page, (<http://www.nrc.gov/NRC/NMSS/MOX>), through an electronic newsletter, through radio advertisements, through press releases, and through direct mailing to individuals who had attended past meetings associated with MOX. Announcements of the meetings were also made in the following local newspapers:

- The Augusta Chronicle (Thursday, April 12, & Sunday, April 15)
- Aiken Standard (Thursday, April 12, & Sunday, April 15)
- North Augusta Star (Thursday, April 12, & Sunday, April 15)
- Savannah Morning News (Thursday, April 12, & Sunday, April 15)
- The State News, Columbia, SC (Sunday, May 6)
- The Charlotte Observer (Sunday, May 6)

The three scoping meetings were held as planned. At each meeting, the NRC staff distributed background materials on the MOX fuel program and NRC's plans for conducting licensing and environmental reviews for the MOX FFF. An open house held before each meeting provided attendees an opportunity to view informational materials and talk informally with NRC staff. During the meeting, the NRC staff presented an overview of NRC's role in the MOX FFF licensing process and described NRC's approach to meeting its obligations under the National Environmental Policy Act (NEPA). The presentations were followed by a question and answer period in which the NRC staff responded to questions from attendees. The majority of time at the meetings was devoted to allowing individuals to express their views on the scope of the EIS. Transcripts of the meetings can be viewed on the World Wide Web at the NRC MOX FFF Information Homepage (<http://www.nrc.gov/NRC/NMSS/MOX>).

A total of about 300 individuals attended the three scoping meetings, and about 80 of them asked questions or provided oral comments at the meetings. In addition, approximately 60 individuals or organizations submitted written comments to NRC by regular mail, fax transmittal, e-mail, or in person at the meetings. Some of the individuals who provided written comments also spoke at the meetings. Some individuals attended and offered comments at more than one meeting.

The public comments are discussed in Section 2 of this summary. All comments received through May 21, 2001, the date announced in the NOI for closing of the scoping period, were considered. Comments received after this date were considered to the extent possible in preparing this report. The comments have been categorized by subject under the following issue headings:

- NEPA Issues
- Policy Issues
- Alternatives
- Ecology, Air and Water
- Cultural Resources
- Cumulative Impacts
- Human Health Impacts
- MOX Fuel Processing
- Transportation Issues
- Waste Management
- Socioeconomics
- Security and Terrorism
- Environmental Justice
- Decommissioning vs. Deactivation
- SRS Infrastructure and Existing Conditions
- Reactor Use Issues
- Lead Test Assemblies

The scope of the EIS and summary of issues that will be addressed in the EIS are discussed in Section 3. Although issues raised during the scoping period will be considered in the preparation of the MOX FFF EIS, some of those issues will either be analyzed in less detail or will not be analyzed at all, depending on their relevance to the proposed action and the anticipated impacts. Issues that will be considered, but not analyzed in detail, are summarized in Section 4. The preliminary outline for the EIS is included as Attachment A.

2. SCOPING COMMENT SUMMARY

2.1 INTRODUCTION

Several commenters voiced their support for the MOX fuel option, stating that it was the best option for using excess plutonium. They cited the commercial MOX reactors in Europe along with an experimental MOX program in the United States as evidence that MOX technology is both safe and feasible. They also believed that converting the plutonium to MOX fuel would make it more difficult to recover the plutonium for future use in nuclear weapons than if it were disposed of by immobilization (i.e., conversion of surplus plutonium into plutonium oxide and then into a ceramic or glass form suitable for disposal in a geologic repository). These commenters also supported the SRS as the best location for the MOX FFF, citing experience, expertise, and existing infrastructure.

Although they were in favor of reducing quantities of weapons-grade plutonium, other commenters felt that the MOX program was not the best method for addressing non-proliferation. These commenters preferred immobilization or continued storage to the MOX alternative. These commenters believed that immobilization would offer the greatest deterrent to terrorism and felt that proceeding with the MOX project would lead to widespread reprocessing of spent nuclear fuel. Several commenters voiced their opposition to the project, but did not provide any basis or provide comments on the scope of the EIS.

Several commenters had specific questions or comments on the Environmental Report (ER) and Construction Authorization Request (CAR) prepared by DCS. These comments will be considered in NRC's review of the ER and in the preparation of the EIS and Safety Evaluation Report (SER).

The following summary groups the comments received during the scoping period, both at scoping meetings and through written submittals to the NRC, by technical area and issue.

2.2 SUMMARY of COMMENTS

2.2.1 NEPA Issues

Consideration of Reactor Use Impacts: A few people commented that NRC should limit the scope of the MOX FFF EIS to the environmental impacts of constructing, operating, and deactivating the MOX FFF. They believed that analyzing impacts of the reactors using the MOX fuel as part of the current MOX FFF EIS would create a "double jeopardy" for DCS in that the company would have to provide data twice: now for MOX FFF licensing and again during the license amendment process for the reactors in which the fuel was to be used. One commenter noted that in order to avoid being accused of segmentation (not looking at the full consequences of an action) the EIS must include reactor impacts in its analysis. Several commenters wanted a supplemental EIS to be prepared for the reactor sites if reactor impacts are not addressed in the MOX FFF EIS. Further discussion of reactor use impacts is provided in Section 2.2.16.

NEPA Coverage for Actions in a Foreign Country: A few commenters believed that the link between the U.S. and Russian programs is so strong that, under NEPA, the United States would be obligated to consider environmental impacts of MOX in Russia. One organization indicated that there was a precedent for conducting a NEPA analysis for a major federal action

having a significant impact in a foreign country. (No specific example was provided.) Another commenter stated that environmental impacts occurring outside the United States and within the borders of a sovereign nation are outside the scope of NEPA.

Supplemental EIS: Several commenters thought that DOE's Surplus Plutonium Disposition (SPD) EIS should be supplemented. They contended that the original EIS did not adequately address the need for the action and the alternatives and that DOE did not conduct an adequate life-cycle analysis of the all-MOX option and the all immobilization option. They maintained that if DOE does not prepare a supplemental EIS, NRC needs to evaluate the full range of alternatives related to the MOX program.

Proprietary Information: A few commenters wanted NRC to evaluate the harm to the public caused by withholding information labeled proprietary. They claimed that there was not enough technical information to adequately evaluate the CAR, especially with respect to health and safety. For example, a complete list of source terms was not available. They would also like to examine the types of information that can be categorized as proprietary.

Use of Existing DOE Documentation and Decisions: A few commenters wanted NRC to make full use of environmental documentation already prepared by DOE and avoid reevaluation of issues where DOE has already made a decision. This position includes adopting the DOE decision that the need for the MOX FFF has been established.

Additional Scoping Meetings: Several commenters asked for additional scoping meetings: at reactor sites, along transportation routes, and specifically at Columbia, South Carolina. In addition, several commenters asked that the scoping period be extended beyond the May 21 deadline.

Communicating Information to the Public: A number of people commented on NRC's efforts to communicate information to the public. There were complaints that ADAMS (Agency wide Document Access and Management System), the system that NRC uses for viewing documents, is not user friendly and that since it was implemented the local public reading rooms at nuclear power plants were eliminated. These commenters felt NRC should provide a computer at the NRC reading room and that the CAR and ER should be made available free of charge. One commenter asked for more informational meetings before the draft EIS is issued. Another commenter wanted NRC to indicate how it will handle distribution of MOX information to the public in the future. A request was made for NRC and DCS to define terms such as "highly unlikely" and "unlikely" and to involve the public in determining the appropriateness of these definitions.

2.2.2 Policy Issues

Price Anderson: The Price-Anderson Act limits the liability of organizations in the event of an incident involving nuclear materials. A commenter asked NRC to put a license condition on the MOX fuel project that MOX fuel cannot be covered by Price-Anderson. A commenter wanted the EIS to include a full disclosure of who is legally (and financially) responsible for MOX fuel accidents, including transportation impacts and reactor accidents.

NRC's Role as Lead Agency: A commenter stated that NRC was too closely tied to the nuclear power industry to impartially evaluate the plutonium fuel project. A commenter stated the belief that NRC receives funding from this regulated community and, at times, acts as an

advocate for nuclear power. A commenter asked that NRC support an independent review of DOE's plutonium work, as recommended by the National Research Council in March 1988.

NRC Experience and Precedent: Several commenters thought that NRC was not qualified to regulate and oversee weapons-grade plutonium. They contended that there is no precedent for NRC to analyze reactor impacts as part of a licensing action for a fuel fabrication facility.

Conflict of Interest: A few commenters expressed concern that NRC may not be sufficiently independent from DOE to review the DCS application. Another commenter asked if using Argonne National Laboratory (a DOE Laboratory) as the contractor preparing the NRC EIS represented a conflict of interest.

Agency Interactions: Some commenters thought that the interactions of NRC, DOE, SRS, and DCS should be considered, particularly in terms of their regulatory roles. One commenter thought the EIS should address the question of who owns the MOX fuel at each stage of the process. Commenters were particularly concerned because both DOE and NRC have regulatory roles related to waste disposal. A commenter wanted to know which agency would have jurisdiction over the waste at each stage of the MOX process. Another commenter stated that the commercial and military nuclear waste materials should remain separate.

Non-Proliferation: A comment was made that the United States should reevaluate its non-proliferation agreement with Russia. A commenter argued that MINATOM (Ministry for Atomic Energy of the Russian Federation) intends to take money from the United States and other western countries and build a plutonium fuel infrastructure and export plutonium fuel.

Another commenter thought that the EIS should consider the proliferation impacts of constructing a MOX FFF, which (according to the commenter) violates a long-standing U.S. policy of separating civilian use and military applications of nuclear technology. According to this commenter, MOX would encourage other countries to develop reprocessing, which would have serious non-proliferation consequences. The possible use of the "polishing" portion of the facility for missions other than purifying plutonium for MOX use was also a concern.

Savannah River Site (SRS) Cleanup Funds: Some commenters wanted the EIS to consider the impacts of recent cuts in cleanup and restoration funds to the SRS. One commenter viewed this as the transfer of funds from the SRS cleanup to plutonium production.

Changes in Project Direction: Some commenters wanted the EIS to consider the impacts that would result if the proposed pit disassembly facility was canceled in favor of using existing infrastructure at the SRS. Another commenter felt that this issue had been adequately explored in the DOE SPD EIS and that NRC should be limited to evaluating the cumulative impacts of this related action.

A commenter asked that the EIS consider the impacts of building a MOX facility and then indefinitely suspending or canceling its use if the Russian political situation changes. Another commenter wanted the EIS to determine the cost of the MOX project if the Russian program were canceled.

Some commenters wanted the EIS to assess the impacts on the MOX program caused by delaying immobilization, in particular the impacts of indefinitely storing the plutonium. Commenters were also concerned that delaying or canceling the immobilization project could lead to greater quantities of MOX fuel.

A commenter thought the EIS should consider the environmental impacts of new reprocessing missions at the SRS that could be triggered by the MOX project. A commenter noted that commercial reprocessing is proposed in legislation in Congress and that the current ban is being reviewed by the Bush administration.

International Implications/Treaties: A commenter pointed out that there were several international treaties that must be identified and analyzed for impacts of MOX commercialization in the United States, including the Nuclear Non-Proliferation Treaty of 1968, the Stockholm Declaration on the Human Environment, and the Law of the Sea Convention.

2.2.3. Alternatives

No-action-Continued Storage: Some commenters wanted NRC to fully develop and advance the No-action Alternative. They pointed out that the Bush administration has questioned the U.S. government's commitment to a dual track approach to plutonium disposition and that it is not clear that the MOX program will go forward in Russia. Furthermore, the immobilization program has been postponed. Given this situation, the MOX program could be subject to continued review, making status quo (continued storage) a likely No-action Alternative. Therefore, some commenters wanted the EIS to consider the implications of the SRS becoming a long-term storage facility for the nation's surplus plutonium if the MOX program did not proceed.

One commenter wondered if adopting the No-action Alternative would be a tacit (indirect) way of saying that the MOX process cannot be done safely. Some commenters wanted NRC to explore the effect the No-action Alternative would have on proliferation and acts of terrorism.

No-action - 100 Percent Immobilization: Several commenters wanted the EIS to consider the costs and programmatic requirements of a 100 percent immobilization alternative. They believed that this was a viable alternative if the MOX project was not licensed. A few commenters specifically thought the EIS should consider (1) cost savings from not pursuing the MOX program, (2) the short- and long-term storage and monitoring requirements of plutonium pits and oxides until immobilization is complete, and (3) decreased waste volumes as compared to the MOX process. Another commenter felt that considering a 100 percent immobilization alternative would be inappropriate since DOE has already set surplus plutonium disposition policy.

One commenter wanted the alternatives to include building an immobilization (vitrification) plant at the Nevada Test Site to minimize transportation distances and maximize distances to population centers.

Conversion of All Surplus Plutonium to MOX Fuel: A few commenters wanted the EIS to consider the impacts of an all-MOX alternative. Many commenters wanted the EIS to be very specific in the quantity of plutonium that would be converted to MOX fuel. These commenters believe that addressing the quantity generically or leaving it open ended could lead to widespread reprocessing of spent nuclear fuel. A commenter wanted the EIS to consider a range of plutonium quantities for processing, suggesting that the amount may ultimately be greater than the 50 metric tons specified by the SPD EIS.

Range of Alternatives: A few commenters wanted to restrict the scope of the NRC EIS to the Proposed Action, the No-action Alternative, siting alternatives within the F-Area, and a reasonable range of MOX FFF design alternatives. They also stated that the official statement

of proposed action and no-action should be broadened to include the issuance of a license to possess and use special nuclear material at the MOX Fuel Fabrication Facility. Other commenters wanted to make sure that the no-action alternatives were considered viable options. That is, the no-action alternatives should be defined so that the EIS could select a no-action alternative and not just do an analysis because it was required by law.

The Paralex Project: Some commenters stated that the No-action Alternative from NRC could mean 100 percent immobilization and immobilization has already been delayed. These commenters wanted the EIS to consider the possibility that DOE would export the surplus plutonium to Canada under the Paralex Project. [Note: The Paralex (parallel experiment) Project would be a joint agreement between Russia, Canada, and the United States to demonstrate the feasibility of burning MOX fuel in a heavy-water-moderated reactor, located at Chalk River, Ontario. The project would use MOX fuel made in the United States and Russia from surplus weapons-usable plutonium out of both countries' nuclear stockpiles.]

Aqueous vs. Dry Purification Process: Some commenters wanted NRC to evaluate both the wet and the dry plutonium purification processes. The analysis should include a cost/benefit analysis that weighs the effectiveness of the process against the costs, the effects the impurities have on the MOX fuel use, waste streams, quantities of waste, etc.

Contingency Issues: One commenter wanted to make sure that the impacts of unusable MOX fuel were assessed, noting that historically MOX production has exceeded use and that if the MOX fuel is stored too long, the plutonium converts to americium, which ruins the reactivity.

2.2.4 Ecology, Air, and Water

Surface Water Impacts: One commenter pointed out that the choice of F-Area for the MOX facilities would probably hasten whatever impacts there would be to Upper Three Runs Creek. The commenter wanted the impact analysis to consider the current conditions of the F-Area, pointing out that it was already contaminated.

Groundwater Quality: A number of commenters expressed concerns about potential contamination of groundwater by plutonium, especially since there are a number groundwater aquifers beneath the F-Area. The Floridian aquifer was specifically mentioned. The point was made that there is already existing groundwater contamination from radioactive releases (primarily tritium) from the SRS (communities downstream from the SRS in both South Carolina and Georgia have already been affected; tritium has been found in wells and surface water). Commenters pointed out that there is the potential that liquid radioactive waste generated by the MOX process, which would contain plutonium, would be stored in the same tanks that “caused” the tritium releases. One commenter pointed out that plutonium studies at the Nevada Test Site and at West Valley in New York have shown that plutonium has migrated much faster than predicted. A commenter wondered if the contaminated water would move between the soil and aquifers via the deep rock borings at the SRS.

Several commenters were concerned that any further contamination of the Savannah River could push the ecosystems “over the edge” and cause serious long-term consequences for human health and the economy that depends on resources from the river. They stated that existing water quality in the Savannah River, and Georgia in general, is compromised and that according to U.S. Environmental Protection Agency (EPA) data the Savannah River is already among the 10 most contaminated rivers in the country.

One commenter wanted the EIS to look at the effects of radioactive storm-water runoff on the ecology of the surrounding area. This commenter thought that storm-water runoff from retention ponds should be captured, not released to creeks.

HEPA vs. Sand Filters: Several people commented on the decision to use high-efficiency particulate air (HEPA) filters instead of sand filters for air filtration in the MOX facility. The point was made that the SRS prefers sand filters which are more efficient, safer and more reliable than HEPA filters. They wanted the EIS to consider the use of sand filters in its analysis.

Air Emissions: A commenter stated that the EIS should look at all air contaminants released by the MOX process, how contaminants will be removed and scrubbed from the air stream, and the probable path of contamination spread through the air. Other commenters noted that over the years, tritium had been released through the air pollution stacks and had fallen back to Earth as radioactive tritiated water, which contaminated the region's well water and agricultural products. One commenter questioned why the MOX FFF would be exempted from the National Emission Standards for Hazardous Air Pollutants as was suggested in the ER prepared by DCS. Another commenter stated that the EIS should consider air emissions from the emergency generators and volatile organic compounds from diesel storage tanks.

Tidal Wetlands: Some commenters were concerned about impacts to tidal wetlands along the Georgia coast, stating that they represent about one-third of the remaining tidal wetlands along the Atlantic shore of the United States. A commenter noted that in addition to ecological impacts, there is the potential for economic impacts to fisheries and other natural marine resources, as high as \$1 billion annually.

General Ecological Impacts: Several commenters felt the ecological impacts were very important and that the EIS should look at the ecological impacts of the proposed facility. One commenter suggested using an ecological system upstream from the site as a benchmark; other commenters stated the impacts to endangered species and habitat should be re-evaluated given the changes to MOX design from what was presented in the DOE SPD EIS, in particular the changes in the waste streams and incremental volumes of waste.

2.2.5 Cultural Resources

One commenter thought the EIS should discuss the impacts of having deadly radioactive wastes in proximity to ancient cultural archeological sites. Another commenter questioned how cultural resources could be managed without a programmatic memorandum.

2.2.6 Cumulative Impacts

Some commenters wanted cumulative impacts to consider all existing (baseline) contamination and future actions at the SRS. Another commenter suggested that this should include all the auxiliary facilities associated with the MOX project. Chemical as well as radiological impacts should be evaluated. One commenter noted that any radioactive contamination of natural resources could have a cumulative adverse effect on businesses that rely on natural resources. Another commenter noted that cumulative build up of contaminated sediments could directly impact human health. It was noted that the Savannah River is currently among the 10 most contaminated rivers in the country and that further contamination would "push the ecosystem over the edge." A commenter thought cumulative impacts would be the appropriate place to consider the impacts on existing SRS infrastructure if construction of the pit disassembly facility was canceled.

2.2.7 Human Health Impacts

Safety Record: Several people expressed concern that DCS did not have an environmental and safety compliance record specific to DCS; there were only individual records for Duke, Cogema, and Stone & Webster. Commenters thought that it was inappropriate for DCS to use the safety data from the Westinghouse contract site. They pointed out that DCS has not established a safety culture; probability assessments and reliance on the fact that nothing bad has happened yet do not prove acceptability. Commenters wanted the EIS to evaluate Cogema's safety record in Canada and France.

Risk Determination: A commenter wanted the degree of uncertainty associated with the risk calculations used in models to be included, especially when data used to support the models were not based on weapons grade plutonium. Another commenter wanted the health-based standards to be based on EPA's 1 in 1 million accepted deaths rather than the 1 in 10,000 allowed by NRC.

Radiation Hazards: A commenter stated that in addition to looking at cancer fatalities, the EIS should address noncancer effects resulting from ionizing radiation exposures, such as immune deficiencies and genetic defects. A commenter thought that accident impacts should consider radiation exposure impacts to all individuals (including children, the unborn, the sick, and the elderly), not only the "standard man."

A commenter wanted the EIS to assess the dose to workers that would result from the MOX process. The analysis should include every worker involved: those at the MOX facility, workers at nuclear laundries, workers at reactor sites, workers at waste disposal sites, etc. A few commenters wanted to know what measures would be taken to protect MOX construction workers from the existing contamination at the MOX site.

Chemical Hazards: A commenter wanted the EIS to include the health effects of chemical exposure both during normal conditions and accident scenarios. The EIS should consider the fact that there will be a radioactive component to the chemical exposure.

Emergency Preparedness: Several commenters were concerned that DCS had not prepared an emergency management plan for the MOX facility. According to commenters, DCS claimed that a plan was not needed because its models showed that the public radiation dose during a major accident would be within regulatory limits. These commenters wanted the EIS to address the implications of running the MOX program with and without an emergency management plan.

A few commenters wanted the EIS to address the SRS Emergency Management Plan. One commenter expressed concern about impacts to the public from a rupture of a high-level waste tank containing MOX waste.

One commenter wanted to be assured that the SRS would communicate safety related information to the public in a timely manner. According to this commenter, there had been a situation where SRS had failed to warn the public about a tritium release that came downstream from the site.

Some commenters thought that the EIS should evaluate the impacts (costs) of having to upgrade the emergency response equipment and train emergency responders in the communities surrounding the SRS and the reactors and along transportation routes. One

commenter made the point that many of the emergency responders are volunteers. Some commenters wanted the EIS to identify the capabilities of local, regional, and national medical facilities to manage acute and long-term casualties resulting from an accidental release. It was noted that medical facilities along transport routes are seldom adequately equipped to treat radiation victims.

A few commenters thought that using computer models to predict possible releases was inadequate and wanted the EIS to include the costs of purchasing and maintaining monitoring equipment on-site and off-site out to 40 miles. This would include monitoring of air, ground, water, vegetation, and livestock. The instrumentation should cover all forms of radiation, including alpha. A commenter stated that it was in the public's interest to know the measured amount of radiation as opposed to a calculated amount.

One commenter stated that an iodized prophylaxis, which could be used to prevent thyroid damage (including cancer), had been approved by the NRC. This commenter wants sufficient quantities to be in place in the event of an accidental release from the MOX FFF. (Note: An iodized prophylaxis is a non-radioactive form of iodine that is administered before exposure to saturate the thyroid and prevent the later uptake of any airborne radioactive iodine that might be dispersed in a nuclear accident. Any additional iodine that is later inhaled or ingested is eliminated by the kidneys.)

Accidents Related to the MOX Process: A commenter wanted the EIS to discuss the worst-case scenario for an accident related to plutonium processing and the safety factors that would be used to protect the public. All the consequences, not just the probability-weighted risks from accidents, need to be considered. Doses to populations as well as to individuals should be provided. Another commenter thought that the EIS should analyze the impacts caused by a criticality accident due to dust accumulation in the air ducts. There was a comment that the accident analyses should include a plutonium fire, given that plutonium is highly flammable in several of its states. A few commenters wanted the EIS to consider the impacts of accidents involving ruptures or explosions of the tanks used to store liquid radioactive waste. One commenter stated that power outages to the tanks could eventually lead to conditions that could cause the tanks to explode.

Other Accident Issues: Some commenters felt that accident analyses in DOE's EIS were inadequate and that detailed accident analyses should be done for the MOX FFF EIS.

Commenters expressed concern that the design basis earthquake assumed by DCS was not as severe as the one normally assumed by DOE for the SRS; this could also be true for the high winds or tornado design basis. A commenter felt that corners were being cut by using less stringent parameters.

A commenter wanted the EIS accident analyses to include scenarios like plane crashes, insider sabotage, missile attacks, truck bombings, the facility dropping into a sinkhole (there are soft zones near the MOX FFF location), and events happening in other nearby areas that could cripple the facility. One commenter wanted the EIS to provide details on the most probable accident.

One commenter thought that human error should be considered in accident analysis, noting that hazards in nuclear power plants are a combination of human and technical errors and that human failings cannot be completely eliminated by using engineering controls.

2.2.8 MOX Fuel Processing

Concerns were raised about the safety of the proposed design for the MOX FFF, in particular the sintering (baking) process that converts the MOX fuel pellets to a ceramic form. Commenters felt that the design for furnace confinement did not adequately protect the public from a plutonium release. A commenter stated that heating the plutonium in an inert atmosphere that contains some hydrogen could result in a hydrogen burn or an explosion if certain controls were violated. Commenters pointed out that similar work at the SRS is carried out in glove boxes, which provides additional containment in case of an accidental release.

A commenter wanted NRC (and the DOE) to conduct a thorough review of all MOX fuel specifications and quality control procedures. This commenter stated that failure to do so would compromise nuclear safety. In addition, the specifications and procedures must be provided to the public.

2.2.9 Transportation Issues

General Transportation Issues: A commenter wanted to know what security measures will be taken to protect the public during MOX fuel transport. In addition, the commenter also wanted the EIS to look at the impacts of transporting the surplus plutonium and the uranium hexafluoride gas to the SRS and of transporting the spent fuel to the storage facility. One commenter asked if the current transportation casks would work for the MOX spent fuel rods.

Some commenters wanted to know how the transport of nuclear materials related to the MOX project would affect traffic and emergency vehicles and if certain highways (specifically Highway 73) would be closed during transport.

A commenter asked what corporate entity would be responsible for the transport of MOX fuel through North and South Carolina and if they would be exempt from liability insurance for transport as they are exempt from liability in operations under Price-Anderson.

A few commenters believed it was not appropriate for NRC to rely on the DOE transportation analyses.

One state agency wanted NRC to consider their comments on the DOE Surplus Plutonium Disposition Final EIS (DOE/EIS-0283) when conducting the MOX FFF EIS analysis and safety review, particularly with respect to transportation and emergency preparedness.

Risks from Transportation Accidents: Some commenters thought that the EIS should evaluate the impacts of transportation accidents on communities in the transportation corridors. Impacts from both truck and rail accidents should be included. In addition to human health impacts, the effects on homes, schools, churches, etc. need to be considered.

One commenter wanted to make sure the transportation risk analysis was put in the proper perspective; for example, the exposure to the public in the event of an accident would be equivalent to that of a dental x-ray. Transportation risks should be compared to those of an exploding gas truck (again, for perspective). DOE's transportation statistics should be compared to those from the Department of Transportation.

2.2.10 Waste Management

Wastes Associated with the MOX FFF: Several commenters expressed concerns about high activity alpha liquid radioactive wastes resulting from the aqueous process that is proposed for removing gallium and other unwanted material from the weapons-grade plutonium. Commenters wanted the EIS to look at the types of wastes produced by this process (solid, liquid, and gaseous), waste storage, treatment, and ultimate disposal; they also wanted details included on the radiological and chemical character of the waste.

There were concerns that not enough waste tanks exist at the SRS to store the large quantities (estimates were as high as 81,000 gallons annually) of liquid radioactive waste that would be generated. One commenter suggested that the existing liquid waste (35 million gallons) be vitrified. Another asked if there would be liquid waste storage tanks dedicated to the MOX FFF.

High-Level Waste: A few commenters raised concerns over waste material supposedly leaking from high-level waste (HLW) storage tanks at the SRS. One commenter noted that 95 percent of the HLW generation from 2000 to 2070 would be from the SRS and wanted the EIS to determine what percentage will be from the plutonium processing facilities.

Low-Level Waste: One commenter stated that NRC must consider the fact that North Carolina will soon be excluded from using the Barnwell site for low-level waste disposal.

Wastes Associated with Converting DUF_6 to DUO_2 : A commenter requested that the EIS consider wastes associated with converting depleted uranium hexafluoride to depleted uranium dioxide.

Spent Fuel Storage: Several commenters were concerned that a final waste site for spent fuel rods has not been determined and that reactor sites currently have spent fuel rods with no place to go. The EIS should address the impacts from the storage of spent MOX fuel at the reactor sites.

Secondary Wastes: A commenter wanted the EIS to include the chemical and radiological character, quantities, treatment methods, and destination of waste produced by the treatment of the original waste (secondary waste). The details should be comparable to those used for primary waste.

2.2.11 Socioeconomics

Economic Effects of Radioactive Contamination on Natural Resources: Some commenters wanted the EIS to assess the economic damage that would result from any radioactive contamination of natural resources. They maintained that the contamination would have a lasting, possibly cumulative, adverse effect on businesses that would not be solved by “cleanup” alone. A commenter pointed out that the economy of the Savannah region was very dependent on natural resources. According to this commenter, about one out of five jobs is related directly or indirectly to natural resources: commercial and recreational fishing, tourism, and seafood processing. About \$1 billion in business is associated with these industries; even a reduction of 1 percent would be \$10 million.

Cost/Benefit Analysis: Some commenters thought that a full cost/benefit analysis of the MOX program should be conducted, including use of MOX as a fuel. The analysis should extend beyond the usual “region of influence” to include national and international impacts as well. The analysis should also be looked at from the perspective of the taxpayer. A national-scale study of costs of the MOX program should be prepared as a report to the General Accounting Office.

Several commenters wanted the EIS to consider the cost of using MOX fuel in a reactor. They stated that Cogema in France recently admitted that the reactor fuel made with separated plutonium was three to four times more expensive than the conventional fuel made with low-enriched uranium. They also pointed out that the cost of using blended highly enriched uranium is lower, as would be the cost for mined uranium, and even uranium processed from the sea.

Costs of the MOX Program: A commenter noted that over the past four years, the estimated cost of the MOX program has doubled. The concern was that in a risk/benefit culture the environment is often compromised to keep expenses down. This commenter did not want the environment to “take the hit” for higher costs.

Electricity Rates: A commenter wanted the EIS to assess costs associated with the MOX program. There were concerns that project cost overruns would be passed on to consumers in the form of rate increases, as has happened, according to the commenter, in the past with the Vogtle nuclear power station.

Government Subsidy of Nuclear Power: A commenter was concerned about the impacts that “yet another” subsidy (funding) of nuclear power would have on the whole energy economy. Would the utilities be paid twice for the same kilowatt hour, once by taxpayers and again by ratepayers? That is, the taxpayers would be paying to produce the MOX fuel, and ratepayers would still be charged the same for electricity from fuel paid for by them (taxpayers). This commenter thought that the plutonium fuel subsidy would give an unfair advantage to nuclear energy suppliers in contrast to the nationwide effort to create a level playing field for energy producers. Also, the subsidy would put other sustainable energy technologies (solar and fuel cells) at a disadvantage. A comment was made that the MOX program no longer had a non-proliferation mission; it was really a subsidy to build a fuel infrastructure in this country using non-proliferation funds.

Land value: Some commenters wanted the EIS to consider the economic impacts on landholders along transportation routes. This would include transportation during all phases: delivery of the surplus plutonium to the SRS; transport of the MOX fuel to the reactors; and transport of the spent fuel to the repository.

2.2.12 Security and Terrorism

Many commenters were concerned about the increased threat of terrorism that would result from the transport of weapons-grade plutonium. A comment was made that the MOX program causes unnecessary transportation of nuclear material, thereby increasing the risk of accident or interception by terrorists. Commenters suggested that both the Proposed Action and the No-action Alternatives should look at the environmental and human impacts resulting from an act of terrorism, including the detonation of a nuclear weapon. One commenter suggested that the EIS should evaluate both foreign and domestic terrorism. Another felt that NRC regulations governing security were inadequate.

Some people thought that immobilization was the best technology for making weapons-grade plutonium less attractive to terrorists. Their arguments included the following: (1) immobilized plutonium would still be highly radioactive, thus making it more theft proof; (2) MOX fuel is very vulnerable to theft since it is not highly radioactive; the plutonium can be separated chemically and is still weapons grade; and (3) plutonium processing cannot properly account for all the plutonium that passes through the fuel cycle; incremental amounts can be systematically removed and used to make terrorist weapons. Other commenters felt that converting the surplus plutonium to MOX fuel was the more effective means of making it unavailable to terrorists.

2.2.13 Environmental Justice

General Comment: One commenter indicated that the National Association for the Advancement of Colored People (NAACP) would be monitoring the environmental justice part of the MOX project carefully. Another commenter pointed out that most African American workers in the area are a captive workforce since few companies are willing to move near the SRS; the same is true for poor whites. Some commenters suggested that the environmental justice analysis in the EIS evaluate the decision making to locate the proposed MOX FFF in the South.

Communicating Information: Concern was expressed that information related to the MOX project was not reaching the African American community. It was suggested that information be conveyed directly via their churches or the NAACP rather than expecting people to search the *Federal Register* for information.

Applicable Geographic Area: One commenter stated that it was not clear how environmental justice would be used in the decision making process. Some commenters thought that the geographic area considered for environmental justice should include communities both downwind and downstream of the MOX FFF. It should also include communities along transportation routes and near reactors. One commenter questioned why NRC had changed the region of analysis from a 4-mile radius to 50-mile radius from the MOX facility. Another commenter encouraged NRC to apply the guidance of the NMSS Policy and Procedures Letter 1-50, Rev 2, "Environmental Justice in NEPA Documents," to its MOX FFF EIS. According to this commenter, the document recommends that a 4-mile radius be used for evaluating Environmental Justice when a facility is in a rural area; evaluations beyond this distance are not warranted.

Subsistence Fishing: A few commenters stated the EIS should consider the effects of radioactive contamination on subsistence fishing. A commenter stated that people of modest income often depend on fishing local rivers for a greater proportion of their nutrition. This could lead to a situation where impacts to surface water could result in a greater than average risk to those modest income individuals.

Civil Liberties: A commenter expressed a general concern about the effects that the use of MOX fuel would have on civil liberties in local, regional, national, and international communities. Infringements on the civilian population due to the security necessary to guard the plutonium was specifically mentioned.

2.2.14 Decommissioning vs. Deactivation

Some commenters thought that the EIS should analyze the impacts of MOX FFF decommissioning (not just deactivation) and any site remediation following decommissioning. Issues such as how the closure and removal will be funded need to be addressed. The terminal facility condition should be compared to its present condition. The NRC should have regulatory responsibility for the facility through the entire project life, including decommissioning. One commenter felt that consideration of decommissioning impacts at this time would be too remote and speculative, pointing out that since the CAR called for the MOX facility to be turned over to DOE at the conclusion of the contract and prior to decommissioning, decommissioning should not be within the scope of the MOX FFF EIS.

2.2.15 SRS Infrastructure and Existing Conditions

Infrastructure: Several people wanted the EIS to address MOX FFF impacts on existing infrastructure. Some commenters wanted the EIS to consider the impacts of processing weapons-grade plutonium at a 50-year-old site with reported cracks in the concrete. There were also commenters who thought the EIS should compare the impacts of the MOX FFF being a dedicated site (including waste storage tanks) to those associated with using existing SRS infrastructure.

Existing Conditions: One commenter thought that the description of existing conditions at the SRS should include the status of all nuclear materials on site, with a discussion of criticality issues.

2.2.16 Reactor Use Issues

General: A commenter noted that in order to avoid being accused of segmentation (not looking at the full consequences of an action) the EIS must include reactor impacts in its analysis. Other commenters wanted assurance that the MOX FFF EIS would be specific to the reactors actually designated to use the MOX fuel and would not ultimately be transferable to all United States reactors. They indicated that, if reactor impacts are not specifically addressed in this EIS, that EIS's should be performed for each reactor site prior to allowing use of MOX fuel.

Another commenter stated the prospect of analyzing reactor impacts as part of the current MOX FFF EIS would create a double jeopardy for DCS in that the company would have to provide data twice: now for MOX FFF licensing and then again during the license amendment process for the reactor.

Reactor Program Licensing and Implementation: A commenter wanted to know what the impacts would be if the Duke reactor license expired before the MOX fuel was used, if the reactors could not meet licensing requirements, or if Duke decided to shut its reactors down early because they were too expensive to run. A commenter wanted the EIS to consider the impacts that would result if the reactor portion of the MOX program was never implemented. Another commenter asked if the MOX FFF EIS would consider impacts of using MOX fuel and the revisions to the existing operating licenses at the Catawba and McGuire plants.

Plutonium Purification: A commenter asked that the EIS assess the impacts on the environment from imperfect gallium removal and the potential of the fuel's "falling apart in the reactor." This commenter noted that both the dry and the aqueous process for removing impurities from the weapons-grade plutonium have their faults – the aqueous process is environmentally destructive (it creates large quantities of high-level alpha liquid waste) and the dry process does not remove gallium as effectively. The tolerance level for gallium in the fuel should be determined.

Use of MOX Fuel in Reactors: Many commenters wanted the EIS to include a thorough investigation of the impacts of using weapons-grade plutonium in commercial reactors. Several commenters wanted the analyses to be specific to the reactor designs at the Catawba and McGuire plants. Commenters contended that weapons-grade plutonium has never been fabricated into fuel before and has never been used in a commercial reactor. They felt it was inadequate to use the MOX program experience in Europe as an analog in safety and performance analyses because the plutonium for MOX fuel in the European reactors comes from spent fuel from nuclear reactors, not weapons-grade plutonium. It was pointed out that the plutonium from dismantled weapons contains a different mix of isotopes than plutonium obtained from reprocessing spent fuel. It was also stated that the experience with low-enriched uranium fuel was not directly applicable because of the different mix of plutonium in that type of fuel and because of differences in performance of the two fuels. The commenters wanted NRC to evaluate the performance of the MOX fuel made specifically with weapons-grade plutonium at the concentrations proposed by DCS.

A few commenters stated that the DOE SPD EIS had already specifically evaluated the use of MOX fuel in the McGuire Nuclear Station and Catawba Nuclear Station reactors, which are the proposed mission reactors. They stated additional evaluations would be more appropriately made at the time of reactor operating license amendment application and that including reactor impacts in the MOX FFF EIS would delay the MOX FFF licensing process, increasing government costs with no commensurate benefit to public health and safety.

Thermal Pollution: Some commenters were concerned about the impacts of thermal pollution from reactors using MOX fuel. They stated that since the temperature in MOX fuel will be hotter, more ice and water will be needed for cooling and the temperature of water at Lake Norman will increase. One commenter maintained that this hotter water is changing the ecology, even down to the microscopic level of the food chain. This commenter stated that even now Lake Norman is warm enough for at least one alligator to survive.

Evacuation issues: Many commenters were concerned about whether the population could be evacuated in time, should an accidental release occur. Traffic on the exits to Interstate 77 around Lake Norman was mentioned as being particularly bad; exit 28 was also mentioned. Another commenter felt that evacuation plans should go beyond the 10-mile radius that the NRC mentions in its publications.

Risks from Reactor Accidents: Several commenters stated that DOE's Surplus Plutonium Disposition EIS addressed generic reactor impacts rather than those specific to the Duke Power reactors that would be using the MOX fuel. They wanted reactor design-specific impacts to be addressed, rather than addressing the accident impacts generically.

Some commenters expressed concern that reactors used at Catawba and McGuire posed a greater likelihood for an accident than did other types of reactors currently in use in this country. Of particular concern were safety issues related to the use of ice condensers for cooling and

the so-called “eggshell” containment at Catawba and McGuire. The point was made that ice condenser reactors lack steel-reinforced containment domes. In addition, a commenter pointed out that there had been violations involving Duke Power’s failure to ensure that ice condenser inlet doors would be able to open if needed, and a forced outage could occur due to a blocked flow channel in portions of the ice condenser.

Comments were made that the Duke Power reactors were already suffering from embrittlement (a condition that causes materials to break without bending). There were concerns that the MOX fuel would cause a higher rate of embrittlement because it burns at such high temperatures. A more specific comment focused on analyzing accident consequences due to loss of power (including backup power) at the reactors.

One commenter pointed out that a severe accident at the Catawba reactors could result in a 25 percent increase in the latent cancer fatalities downwind of the reactor, resulting in anywhere from hundreds to thousands of additional cancer deaths. Another commenter wanted the EIS to consider the impacts of using plutonium fuel rather than uranium oxide fuel. A commenter stated that even DOE has admitted that the operation of nuclear power plants with plutonium fuel rather than uranium oxide fuel increases the deaths in certain accident scenarios. According to a commenter, one accident scenario had 8 percent more deaths from use of plutonium fuels rather than uranium fuel; another had 14 percent.

2.2.17 Lead Test Assemblies

Some commenters wanted NRC to fully provide and review all procedures for the fabrication of the lead test assemblies, including review of all the facilities involved, their records, quality control procedures, and the transport implications.

3. SCOPE OF THE EIS AND SUMMARY OF ISSUES TO BE ADDRESSED

The NEPA (Public Law 91-90, as amended), and the NRC’s implementing regulations for NEPA (10 CFR Part 51), specify in general terms what should be included in an EIS prepared by the NRC. Regulations established by the Council on Environmental Quality (40 CFR Parts 1500-1508), while not binding on the NRC, provide useful guidance.

Pursuant to 10 CFR § 51.71(a), in addition to public comments received during the scoping process, the contents of the draft EIS will depend in part on the December 2000 environmental report submitted by DCS. Pursuant to 10 CFR § 51.71(b), the draft EIS will consider major points of view and objections concerning the environmental impacts of the proposed action raised by other Federal, State, and local agencies, and by any affected groups of Native Americans. Pursuant to 10 CFR § 51.71(c), the draft EIS will list all Federal permits, licenses, approvals, and other entitlements which must be obtained in implementing the proposed action, and will describe the compliance status with these requirements. Any uncertainty as to the applicability of these requirements will be reflected in the draft EIS.

Pursuant to 10 CFR § 51.71(d), the draft EIS analysis will include a consideration of the economic, technical, and other benefits and costs of the proposed action, and alternatives to the proposed action. In the draft analysis, due consideration will be given to compliance with environmental quality standards and regulations that have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection, including any applicable zoning and land-use regulations and water pollution limitations or requirements

established or imposed pursuant to the Federal Water Pollution Control Act. The environmental impact of the proposed action will be considered in the draft analysis with respect to matters covered by such standards and requirements regardless of whether a certification or license from the appropriate authority has been obtained. Compliance with the environmental quality standards and requirements of the Federal Water Pollution Control Act (imposed by the United States Environmental Protection Agency or designated permitting states) is not a subject for and does not negate the requirement for NRC to weigh all environmental effects of the proposed action, including the degradation, if any, of water quality, and to consider alternatives to the proposed action that are available for reducing adverse effects. While satisfaction of NRC standards and criteria pertaining to radiological effects will be necessary to meet the licensing requirements of the Atomic Energy Act, the draft analysis will, for the purposes of NEPA, consider the radiological effects of the proposed action and alternatives.

Pursuant to 10 CFR § 51.71(e), the draft EIS may include a preliminary recommendation by the NRC staff respecting the proposed action. Any such recommendation would be reached after considering the environmental effects of the proposed action and reasonable alternatives, and after weighing the costs and benefits of the proposed action.

The scoping process summarized in this report helped to determine the scope of the MOX FFF EIS and identified the significant issues to be analyzed in depth. For instance, in response to comments received during the scoping process, the EIS will evaluate the potential impacts of using sand filters instead of HEPA filters, and the potential impacts of using both wet and dry plutonium purification processes in manufacturing MOX fuel. Other options may be identified and analyzed. The EIS will also evaluate the degree to which impacts would vary depending on where within the SRS F-Area the proposed MOX FFF may be located. This will include consideration of surface water impacts as suggested by a commenter. Cumulative impacts of the proposed action will be addressed in detail.

The No-action Alternative, not licensing the MOX FFF, was also refined through the scoping process. In addition to the potential environmental impacts of the proposed action, the EIS will evaluate two no-action alternatives: (1) continued storage of all of the surplus weapons-grade plutonium at the present DOE sites in an unaltered form; and (2) immobilizing all of the surplus weapons-grade plutonium at the SRS site. Other alternatives may be identified and analyzed during the preparation of the draft EIS.

Issues to be analyzed in depth pertain to the construction, operation, deactivation and decommissioning of the MOX FFF, and transportation of fresh MOX fuel. Ordinarily, an NRC environmental impact statement also discusses in detail the need for the proposed action. Here, however, DOE has already addressed the need for the MOX FFF (see Section 2.2 of the DCS Environmental Report), and the EIS will reference the purpose and need analyses performed by DOE pursuant to NEPA. Impacts associated with transportation of materials to the SRS for the purpose of manufacturing MOX fuel, impacts of converting the depleted uranium, impacts of reactor use of MOX fuel, and the transportation and disposal of spent MOX fuel will be discussed. The EIS will recognize previous NEPA analyses performed by the DOE, including (1) the *Surplus Plutonium Disposition Final Environmental Impact Statement* (SPD EIS) (DOE/EIS-0283); (2) *Final Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride* (DOE/EIS-0269); (3) *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye*

County, Nevada (YMP EIS) (DOE/EIS-0250D); and (4) the Supplement to the Draft YMP EIS (DOE/EIS-0250D-S). Discussion of impacts associated with the two No-action Alternatives will be based largely on the SPD EIS.

Our goal in writing the EIS is to set forth the impact analyses in a manner which is readily understandable by the public. Decisions and the rationale for those decisions will be described in sufficient detail early in the EIS. Significant impacts will be discussed in greater detail in the body of the EIS. Topical areas whose impacts are less significant will be discussed in appendices to the EIS, with an explanation of why they were found to be less significant. This should allow readers of the body of the EIS to focus on issues that were important in reaching the conclusions of the EIS. The following topical areas and issues will be analyzed in the EIS:

- **Geology and Seismicity.** The EIS will describe the geologic and seismic characteristics of the proposed site. Evaluation of the potential for earthquakes, ground motion, soil stability concerns, surface rupturing, and any other major geologic or seismic considerations that would affect the suitability of the proposed site for the construction of the MOX FFF will be addressed primarily in the construction SER and summarized in the EIS. The EIS will not, however, evaluate the safety aspects associated with these site characteristics which will be addressed in the SER.
- **Hydrology.** The EIS will assess the potential impacts of the proposed project on surface water, storm-water runoff, and groundwater resources including the Floridian aquifer. The assessment will consider water resources, water quality, water use, flood plains, and the probable maximum flood (the largest flood that is likely to occur). The environmental mobility of the significant radionuclides, including plutonium, will be assessed. The EIS will not, however, evaluate the safety aspects associated with these site characteristics which will be addressed in the SER.
- **Air Quality.** Potential air quality impacts of the proposed project will be evaluated in the EIS. The evaluation will include potential impacts resulting from construction activities and operation (both with HEPA filters and sand filters) and will compare the anticipated air quality impacts, if any, with relevant standards.
- **Ecology.** The EIS will assess the potential environmental impacts of the proposed facility on ecological resources, including wetlands, plant and animal species, and threatened or endangered species and critical habitat that may occur in the area. As appropriate, the assessment will include potential effects on wildlife migration patterns; mitigation measures to address adverse impacts will be analyzed.
- **Land Use.** An analysis of impacts of accidents on existing land use along transportation corridors will be conducted. The EIS will also discuss the impacts of the MOX FFF on future land use on the SRS.
- **Cultural Resources.** The EIS will assess potential impacts of the proposed project on the historic and archaeological resources of the area. The EIS will also describe the programmatic framework of how cultural resources are evaluated at SRS and for the MOX FFF.

- **Transportation.** As discussed above, the transportation impacts of shipping MOX feedstock to SRS and shipping spent MOX fuel to a geologic repository will be discussed. The EIS will contain an analysis of potential impacts resulting from the transportation of fresh MOX fuel, and will assume (for purposes of ensuring that NEPA's objectives are met) that one or more commercial power reactors will later be authorized to use MOX fuel. Accordingly, the EIS will consider relevant aspects of both rail and truck transport of the fuel from the proposed MOX facility to the Catawba and McGuire reactors. The EIS will discuss the number, type, and frequency of shipments, as well as routing considerations and the quantities of MOX fuel being shipped. The impacts of transportation will be evaluated primarily in terms of radiological exposure risk to the population during normal transportation (including handling, transfer, and inspection) and under credible accident scenarios. The non-radiological impacts of transportation will also be identified and evaluated. The impacts on the usability or level of service of the roads, particularly near the SRS (such as Highway 73), will also be evaluated.
- **Infrastructure.** The EIS will address issues related to availability and adequacy of the infrastructure at the SRS such as waste treatment, and utility services to handle the needs of the proposed facility. The EIS will also consider impacts from any upgrades to these infrastructure.
- **Waste Management.** Waste management was identified as a significant issue by many commenters. The EIS will document the quantities, types, treatment, and disposal of the various potential waste streams. The EIS will also consider the impacts of storage of waste, such as the impacts on the existing high level waste tanks at SRS. The EIS will analyze the incremental impacts of MOX FFF wastes to existing facilities at SRS and at other DOE and non-DOE facilities. The EIS will evaluate the impacts of wastes generated at the MOX FFF either specifically or through incorporation of reference material from existing NEPA documents that analyze the overall waste management impacts at the SRS.
- **Socioeconomics.** The socioeconomic issues that fall within the scope of the EIS include the direct and indirect economic impacts on city, county, and school district revenues and expenditures, property values, residential and commercial development, housing, and public services in a four county region surrounding SRS. In addition, the economic effects on employment (including agricultural employment), unemployment and income in a 15-county region will be evaluated. These would include potential economic impacts to commercial fishing downstream of SRS. The EIS will include an analysis of the impacts on these resources that would result from the construction and operation of the proposed facility. National level impacts will be discussed under cost-benefit analysis.
- **Environmental Justice.** Potential for disproportionately high or adverse human health or environmental impacts on the minority and low-income populations will be evaluated and discussed at the census block level. Environmental justice will not be evaluated in detail along transportation routes because of the uncertainty associated with routing.
- **Aesthetics.** The EIS will analyze the visual impacts from the MOX facility being constructed in the F-Area at the SRS.

- **Human Health Impacts.** The potential human health impacts of the proposed facility on the workers and the general public will be evaluated for normal operations (including handling, transfer, and inspection activities) and under accident conditions. Potential exposures to radioactive elements and to chemicals will be considered. Both cancer and non-cancer health effects will be evaluated, as appropriate. Calculations for the general public account for sensitive populations as well as normal healthy adults. Models, assumptions, and supporting data used to develop the impacts from these potential exposures will be clearly described. The SER will assess the impacts associated with all credible accidents at the proposed facility, both from natural events and human activities. The EIS will analyze the potential environmental impacts resulting from bounding credible accidents at the proposed facility.

Emergency preparedness and environmental monitoring were raised as significant issues by several commenters. The need and extent for emergency preparedness and environmental monitoring, in context of the EIS, would be considered as mitigation measures for potential impacts. These issues may be discussed in the EIS to the extent that they are required as mitigation measures. Emergency preparedness and environmental monitoring will be addressed in greater detail in the operation SER .

- **Decommissioning.** The December 2000 Environmental Report (ER) submitted by DCS considered only deactivation. Evaluating the impacts of decommissioning was identified during the scoping process as a significant issue and is required by NEPA. The EIS will evaluate the impacts of deactivating and decommissioning the proposed MOX FFF.
- **Cumulative Impacts.** The EIS will analyze the potential cumulative impacts of the proposed facility when added to other past, present, and reasonably foreseeable future actions. This will include impacts from auxiliary and infrastructure facilities associated with the MOX project. It will also include impacts to resources such as the Savannah River.
- **Unavoidable Adverse Environmental Impacts.** A discussion will be provided on the potential environmental impacts that could not be avoided if the proposed action were to be implemented.
- **Irreversible and Irretrievable Commitment of Resources.** The irreversible and irretrievable commitment of resources, including land use, materials, and energy will be discussed. Potential waste minimization and pollution prevention activities and mitigation measures will be discussed.
- **Cost/Benefit Analysis.** The EIS will include a cost/benefit analysis that summarizes the environmental and other costs and benefits of the proposed action.
- **Compliance with Applicable Regulations.** The EIS will present a listing of the relevant permits and regulations that are believed to apply to the proposed facility.

Pertinent proprietary information, although not available to the public, will be reviewed by the NRC in preparing the SERs and the EIS. As indicated above, all available documentation generated by DOE and other agencies that is related to dispositioning of surplus weapons-grade plutonium and MOX fuel production will be used, as appropriate.

4. ISSUES CONSIDERED PERIPHERAL, OUTSIDE THE SCOPE OF THE PROPOSED ACTION, OR COVERED BY PRIOR ENVIRONMENTAL REVIEW

Issues raised during the scoping period for the MOX FFF EIS are summarized in Section 2. Section 3 outlines the subjects and issues that will be addressed in depth in the EIS. Issues raised during the scoping period have been considered in the preparation of this scoping report and are reflected in Section 2. As discussed below, certain issues will not be addressed in depth in the EIS. Major categories of these issues and the reasons for not analyzing them in detail in the EIS are explained below. In general, these issues are not directly related to the assessment of potential impacts from the proposed major federal action now under consideration. The lack of in depth discussion in the EIS, however, does not imply that an issue or concern lacks value. Issues beyond the scope of the EIS may be appropriately discussed and decided in other venues. For example, many commenters were concerned about the lack of a safety record for DCS. This issue will be addressed in the SERs.

4.1 PREVIOUS DOE DECISIONS

A number of commenters requested that the SPD EIS prepared by DOE be supplemented and many of the decisions already made by DOE be revisited. Because the scope of the MOX FFF EIS is limited to the licensing action now under review by NRC, which is specific to the MOX FFF, issues pertaining to decisions already made by DOE will be addressed by referencing the appropriate DOE analysis.

4.2 INTERNATIONAL AGREEMENTS AND NATIONAL, STATE, OR LOCAL LAWS, STATUTES, AND REGULATIONS

Comments that seek to alter international treaties or affect national, state, or local laws, statutes, or regulations (e.g., comments that asked to alter Price-Anderson Act limits) will not be addressed, because they do not pertain to reasonably foreseeable impacts arising from the proposed construction and operation of the MOX FFF.

4.3 REACTOR USE OF MOX FUEL

Comments on the scope of assessing reactor use impacts in the EIS for the MOX FFF were varied (see Section 2.2.16). The NRC will consider the environmental impacts resulting from the use of MOX fuel, pursuant to 10 CFR Part 51, if and when nuclear power plant operators apply for a license amendment to use such fuel. Nevertheless, since a MOX FFF is expected to fabricate fuel for use in one or more nuclear power reactors, it is reasonable to consider the impacts of reactor use as an indirect impact in the EIS. At this time, NRC is aware that two plants, McGuire and Catawba, are considering using MOX fuel under the DOE program. The NRC is aware that DOE has analyzed the reactor use impacts of MOX fuel in its SPD EIS. Scoping comments related to reactor use impacts that were determined to be beyond the scope of this EIS will be forwarded to the appropriate NRC offices.

4.4 COST AND READINESS TO RESPOND TO EMERGENCIES

A number of commenters requested that the MOX FFF EIS analyze the impacts of having to upgrade the emergency response equipment and retrain emergency responders in the communities around the SRS, at the reactors, and along transportation routes. Other commenters requested that the EIS identify capabilities of local, regional, and national medical facilities to manage the casualties resulting from potential accidental releases and assess the readiness of communities to evacuate certain areas along the transportation routes in case of an accident. The human health impacts of potential accidents will be analyzed in the EIS. However, the costs associated with emergency preparedness and capabilities of local, regional, and national communities to respond to emergencies will not be analyzed, because such impacts are not specific to the proposed action. It is not anticipated that activities related to the proposed action will require any emergency response capabilities among communities beyond what they already have for similar purposes. Issues related to general emergency preparedness of communities are outside the scope of this EIS.

4.5 POTENTIAL DELAYS IN DOE PROGRAMS

Several commenters wanted to know what would happen if the DOE programs related to weapons-grade plutonium disposition and the opening of the HLW repository were delayed. Any such potential delays are either speculative or do not clearly affect the licensing review of the MOX FFF by the NRC. Unless it is reasonably foreseeable that a change in a DOE program or that of any other federal agency (e.g., a formal decision either has been announced or is expected to be announced soon) will have a substantive effect on the licensing of the MOX FFF, the EIS process will continue as scheduled, and the impacts of potential delays will not be analyzed in the EIS.

4.6 IMPACTS FROM TERRORISM

Many commenters raised a number of different issues concerning terrorism. However, the EIS will not address the impacts of terrorism, because these impacts are not considered to be reasonably foreseeable as a result of the proposed action.

4.7 IMPACTS OF ACTIONS IN THE RUSSIAN FEDERATION

All activities in the Russian Federation related to manufacture of MOX fuel from Russian-origin weapons-grade plutonium as part of an agreement between that country and the United States are being undertaken by the Russian authorities. They are not subject to NEPA and, therefore, will not be analyzed in the EIS.

4.8 PROPRIETARY INFORMATION

NRC will evaluate all pertinent proprietary information in its decision to grant authorization to construct the MOX FFF and to grant a license to DCS to possess special nuclear material. However, by law, NRC has to protect the proprietary information from public disclosure. Therefore, proprietary data will not be released to the public.

Attachment A
Preliminary Outline
for the Mixed Oxide Fuel Fabrication Facility EIS

Summary

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