



# SRS Citizens Advisory Board

## Environmental Remediation Committee

### Meeting Summary

March 7, 2000  
North Augusta Community Center  
North Augusta, SC

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#### CAB Members

Jimmy Mackey\*  
Maria Reichmanis\*  
Beaurine Wilkins\*  
Kathryn May\*  
Murray Riley\* (not present)

#### Stakeholders

Scott Flickinger  
Gerald Devitt  
Perry Holcomb  
Eugene Rollins  
Rick McLeod (CAB Tech.  
Advisor)  
Todd Crawford

#### Regulators

Keehna Frazier, SCDHEC  
Shelly Sherritt, SCDHEC  
Jack Getting, SCDHEC

#### DOE/Contractors

Jim Moore, WSRC  
Gerald Blount, WSRC  
Gerry Stejskal, WSRC  
Gerri Flemming, DOE  
Kim Johnson, BSRI  
Philip Prater, DOE  
Don Toddings, BSRI  
Terry Bland, WSRC  
Michelle Ewart, DOE  
Brian Hennessey, DOE  
Bob Blundy, BSRI  
Karen Adams, DOE  
Mary Harris, WSRC  
Paul Sauerborn, WSRC

\*Denotes CAB ER Committee Members

**Introduction:** Jimmy Mackey introduced himself as the new ER Committee Chairman and Maria Reichmanis as the vice chair. Mr. Mackey then asked for introductions.

**Schedule Review:** Paul Sauerborn reviewed the ER Committee matrix, which addresses upcoming meetings and topics. Mr. Sauerborn asked that issues or concerns with the matrix be brought to his attention.

**Response to CAB Recommendation 106:** Gerald Blount stated that he would discuss remediation of the Mixed Waste Management Facility (MWMF) southwest plume in response to Citizens Advisory Board (CAB) Recommendation 106. Mr. Blount indicated that the response was the work of the Savannah River Site (SRS) in conjunction with the South Carolina Department of Health and Environmental Control (SCDHEC). Mr. Blount stated that from the SRS and SCDHEC point of view, everyone must understand that the Burial Ground Complex requires action. It is a technically complicated system and care should be exercised not to oversimplify decisions.

Mr. Blount stated the problem is that hazardous and non-hazardous contaminants are being discharged into Fourmile Branch at concentrations/activities greater than acceptable standards. The remedial action objective is to mitigate the discharge of contaminants into Fourmile Branch, and the most likely response action is seepage management with disposition of tritiated water through irrigation.

Shelly Sherritt from the SCDHEC stated the scenario is not just the threat to the environment, but the State requires that SCDHEC preserve the States resources. Mr. Blount continued with the discussion by drawing a comparison between nuclear industry standards and drinking water standards in order to demonstrate why an action was required at the MWMF southwest plume seepage. Mr. Blount stated the following conclusions relative to the comparison of nuclear industry with drinking water standards:

- drinking water standards (4millirem/year) are conservative because the general population is not willing to accept risk
- levels at the seeps exceed SRS administrative standards for dose in human tissue assuming an ingestion scenario
- levels at the mouth of Fourmile Branch exceed the 4mrem/year standard assuming ingestion

Gene Rollins asked about the origin of 4mrem/year dose. Ms. Sherritt stated that the State assigned the EPA dose of 4mrem/year.

Mr. Blount presented the criteria related to the application of standards at SRS. Mr. Blount stated that SRS has agreed to manage hazardous materials in a fashion consistent with the regulatory standards under the Resource Conservation and Recovery Act (RCRA). Mr. Blount also stated that the public prompted the SRS (through legal action) to mitigate releases of materials that were not a part of the prevailing environmental laws (RCRA), and that SRS entered into a settlement agreement with South Carolina to apply other applicable rules and standards to the extent that is technically and economically feasible.

Mr. Blount discussed the criteria related to the application of standards for South Carolina based on discussions with SCDHEC.

Todd Crawford stated that in his opinion, the risk of someone drinking the water at the seep was not likely because the water is well within the SRS boundary and not accessible by the general public. Mr. Mackey also asked why there is such a stringent standard in place, when the chance of being a threat, in his opinion, is small. Mr. Blount stated SCDHEC has determined the groundwater in the area and surface water of Fourmile Branch is considered potential drinking water by the state of South Carolina, therefore they imposed the application of the primary drinking water standards to tritium and volatile organic compounds (VOC) and it is the goal of the SCDHEC to restore water quality to its classified use.

Mr. Blount discussed the MWMF RCRA on which the SRS and the regulatory agencies had extensive discussions on the technical practicability of the migration of the tritium discharges to Fourmile Branch. The permit requirements are in three phases. Phase One requires the reduction of the tritium flux to Fourmile Branch by 70% in the near term, to monitor the effects of interim actions, to install a monitoring well network, and remediate the VOC hotspots.

Phase Two requires an evaluation of the performance of Phase One, additional actions to eventually achieve tritium activities at or below 20 pCi/ml, and management of the entire VOC plume.

Phase Three requires a performance evaluation and modification to improve effectiveness.

In conclusion, Mr. Blount addressed the approved corrective action plan.

- Stage One consists of water capture with impoundment, approximately 30 acres of irrigation

- Stage Two water capture with french drains approximately 80 acres of irrigation
- Future stages of french drains and 600-800 acres of irrigation.

Gerry Devitt stated he believed the presentation was a display of numbers that did not address his inquiry, which is, "would doing nothing have an impact on down river residents".

Phil Prater stated that the Department of Energy has agreed to be good stewards of the State. Mr. Prater stated the State gave some flexibility on the issue of the seep relative to the degree of remediation imposed, allowing for an achievable cost-effective solution.

**K-Area Burning / Rubble Pit and Rubble Pile Statement of Basis / Proposed Plan:** Karen Adams provided a brief history of both the rubble pit and the rubble pile. The pit received oils, paper, rubber and solvents of unknown origin, which were burned. The site was operated from 1959-1973, then filled with debris and covered to grade. The rubble piles were distributed in a semicircular pattern adjacent to the pit, which received inert rubble from the construction of the K-Area Reactor.

Ms. Adams stated that both the pit and the piles contained polycyclic aromatic hydrocarbons (PAH), which are common environmental pollutants created from burning fuels, contained in common construction materials and natural resources. Ms. Adams explained the remedial action objectives for the soils in the pit and piles are to protect future, industrial workers from unacceptable exposures to the PAH and arsenic found only in the piles. Ms. Adams stated the remedial alternative selection is a soil cover with institutional controls.

Ms. Adams stated that the TCE and PCE contamination in the upper water table is less than 60 parts per billion. The remedial objectives for the groundwater are to protect the future, industrial workers from unacceptable exposures to TCE and PCE in groundwater and prevent further contamination of groundwater by allowing it to attenuate to levels below current drinking water standards of 5 ppb. The remedial alternative selection is monitored natural attenuation. Beaurine Wilkins asked if the workers performing the cleanup would be exposed to the contamination. Ms. Adams stated the workers would be protected by the personal protective equipment they would be wearing during the remediation.

Ms. Adams stated that if the maximum contamination levels were exceeded at the compliance wells that monitor both the pit and piles, a contingency remedy would be deployed.

**Phytoremediation:** Bob Blundy presented an overview of phytoremediation at SRS. Mr. Blundy stated that plants create an extensive microbial community in the root zone, which breaks down chemical compounds in the soil to facilitate their growth. Plants absorb many organic and inorganic compounds as part of the natural growth processes, i.e., nitrogen, carbon, phosphorous and essential trace metal nutrients, which is called phytoextraction. Certain plants, Mr. Blundy stated can hyperaccumulate metals in their woody biomass. Mr. Blundy stated, that phytoremediation is perceived as a very acceptable "green technology", which could lower cleanup costs and be applied to extensive areas of low-level contamination, where costs prohibit cleanup using conventional technologies. Another benefit is the wide range of contaminants that can be remediated by phytoremediation.

Jimmy Mackey asked if phytoremediation would be a good candidate for the Burial Ground Complex. Mr. Blundy replied that to allow the roots to penetrate the man-made membrane of the cap would allow water infiltration and cause a potential problem. Mr. Blundy stated that phytoremediation would be effective to a depth of ten feet into the ground. Ms. Wilkins asked how contamination found in the woody part of the plant is disposed. Mr. Blundy stated that disposal would be determined by the type of contamination the wood contained. Mr. Blundy said disposal is another issue that will have to be addressed for each deployment of phytoremediation.

Mr. Blundy noted the following limitations:

- The effectiveness is limited to the depth of the root zone, toxicity limits application to low-contaminant concentrations.
- Particularly with metals, seasonal variations, lack of experience with field performance, uncertainty associated with the ability to meet clean up criteria, and the uncertainty of contamination entering the food chain.

This technology has been deployed at DOE and DOD locations throughout the country. At SRS there are several proposed phyto deployments.

Mr. Blundy stated that there are both short and long-term challenges with this technology. Currently, phytoremediation of VOC's, tritium and constructed wetlands are considered practical. However, achieving acceptable system performance (i.e., achieving MCLs), long-term performance monitoring for applications on organic solvents, and Regulator and stakeholder acceptance for waste unit closure is still under review.

Mr. Crawford, a retired SRS employee, stated that he had knowledge of trees being planted many years ago in the R-Area basin for the purpose of experimentation. Mr. Crawford suggested this area be investigated for valuable information in support of phytoremediation.

Shelly Sherritt stated that SCDHEC was open to the use of new technology. She also stated that the time required to reach a cleanup goal is established by the regulators.

Mr. Mackey thanked the presenters and other attendees and the meeting was adjourned.

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