

Mountains & Marshes

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Chem-Nuclear Special Reprint Edition 2007

SCELP, Sierra Club Seek End to Leaking Radioactive Waste

On behalf of Sierra Club, the South Carolina Environmental Law Project (SCELP) is seeking to end the practice of burying radioactive waste in leaking containers.

Working with Columbia attorney Bob Guild, SCELP is appealing the renewal of the permit for the Chem-Nuclear Low Level Radioactive Waste Landfill at Barnwell. We are seeking improved landfill designs and operating procedures to prevent expansion of a long-standing problem with leaking radioactive waste. During a four-day hearing in February 2005, we presented evidence showing that the current landfill design is flawed and that better means of containing the wastes are readily available.

The Chem-Nuclear landfill has operated since the early 1970s as one of the nation's largest dumping grounds for "low level" radioactive wastes. "Low level" does not mean that these wastes are harmless. Some of these wastes will present dangers for thousands of years. The wastes at the site include everything from low hazard contaminated hospital clothing to high hazard uranium and old nuclear power plant reactor vessels. The wastes are buried in trenches at a site just outside the Town of Barnwell.

The present appeal represents the first time that the permit for the Chem-Nuclear facility has been challenged.

In early years, wastes were buried in cardboard boxes and other makeshift containers. Although it was initially predicted that any

leaks from the landfill would take more than 424 years to result in radioactive contamination of nearby streams, in fact radioactive tritium was found in monitoring wells shortly after the landfill opened, and a nearby stream, Mary's Branch, was contaminated within 20 years. Mary's Branch flows into Lower Three Runs Creek on the Savannah River Site, and that creek runs to the Savannah River.

The Barnwell site has always been among a very small number of radioactive waste burial grounds in the United States. The unfairness of a few states bearing the entire burden of radioactive waste has been long recognized. During the 1980s, Congress passed a law stating that disposal of radioactive waste is the responsibility of the state where the waste is generated. The new law allowed groups of states to form waste compacts to limit import of radioactive wastes from other states. In 1982, South Carolina joined the Southeast Compact with seven other southeastern states. Under the compact agreement, the Chem-

Nuclear site was to serve the seven states until 1992, when it would shut down. North Carolina was supposed to open a new disposal site in 1992 to serve the southeast region. But the North Carolina site ran into great public opposition and was never opened.

Instead of shutting down, under Governor David Beasley, South Carolina withdrew from the Southeast Compact and the Chem-Nuclear site was again allowed to receive waste from the entire na-



This is an aerial view of a portion of the Chem-Nuclear Radioactive Waste Landfill near Barnwell.

(Continued on page 2)

The South Carolina Environmental Law Project

SCELP is a 501c3 non-profit public interest law firm. We are funded by private donations and grants.

Since 1987, we have been at the forefront of nearly all environmental law issues in South Carolina. SCELP's cases have saved wetlands and other natural resources, improved water and air quality, reduced hazardous waste risks, and helped enforce environmental laws. SCELP's clients include local, state and national groups. We provide continuing legal advice to concerned citizens and promote environmental law education.

The Chem-Nuclear case is just a small sample of our work. Please check our website **www.scelp.org** for more information and updates on our other cases.

Seeking An End to Leaking Radioactive Waste

(Continued from page 1)

tion except North Carolina.

In 2000, under Governor Jim Hodges, South Carolina joined with New Jersey and Connecticut to form the Atlantic Compact. Current laws still allow some wastes from non-Compact states to be buried at Barnwell, but by 2008 the Chem-Nuclear site will be limited to wastes from the three compact states.

When North Carolina was trying to create a new waste disposal site, Chem-Nuclear was the successful bidder in a competition to design the new facility. The design Chem-Nuclear proposed for North Carolina was significantly different, and more protective of the environment and human health, than the design used at Barnwell. The North Carolina facility would place the wastes above ground, on a thick layer of reinforced concrete forming the floor of burial units. Within these units, wastes would be put into concrete vaults in addition to the "high integrity containers" used for shipping the wastes to the site. All waste disposal activities would be conducted under roofs, to prevent contact with water. The waste vaults would be grouted and sealed to prevent infiltration of water.

During the 1990s, Chem-Nuclear began using concrete vaults at the Barnwell site. These vaults differ, however, from those proposed in North Carolina. The Barnwell vaults have holes in the bottom of them to allow water that enters the vault to drain off into the surrounding soil. Water enters the vaults during normal operations, as operations are not conducted under roofs. The Barnwell vaults are not sealed to prevent water infiltration and their concrete walls are simply designed to support the soil that is placed over the vaults.

As noted earlier, Chem-Nuclear uses trenches dug into the ground at Barnwell. The bottoms of the trenches are supposed to be at least five feet above the highest groundwater table. However, Chem-Nuclear has admitted that it has detected high groundwater levels that rose up into closed trenches. The holes in the bottoms of the Barnwell vaults will allow water from rising groundwaters to enter the vaults.

A dry disposal operation is superior to one in which water is allowed to make contact with the waste. Water serves as the primary factor in both the breakdown of vaults, as well as other containment barriers, and the transportation of radioactive materials into groundwater aquifers and later into surface streams. Surface stream infiltration could then lead to human contamination.

Since the early 1990s, members of the DHEC Board and others have raised questions about improvements in the Barnwell design. In 2001, as part of DHEC's review of the permit renewal, the DHEC staff directed Chem-Nuclear to investigate alternative designs related to water intrusion. Chem-Nuclear provided DHEC with several conceptual design changes and predicted a two-year time frame for final design, DHEC approval and implementation. Yet in 2004, DHEC issued the renewal permit without requiring any follow-up by Chem-Nuclear on the

(Continued on page 3)

South Carolina Environmental Law Project, Inc.

(a 501c3 tax-exempt non-profit corporation)

Mission Statement

*To protect the natural environment
of South Carolina
by providing legal services and advice
to environmental organizations
and concerned citizens and
by improving the state's system
of environmental regulation.*

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Seeking an End to Leaking Radioactive Waste

(Continued from page 2)

new designs.

At the appeal hearing, conducted in February 2005, Chem-Nuclear and DHEC conceded that simple design changes would significantly reduce the risk of water intrusion into landfill vaults. DHEC said it “could have” required the changes, but provided no explanation of why it did not require Chem-Nuclear to adopt better designs. Although DHEC touted a lengthy “Technical Evaluation Report” as evidence of the DHEC staff’s thorough review of the Chem-Nuclear facility, on cross-examination, DHEC’s Henry Porter admitted that the report had been entirely written by Chem-Nuclear. When asked whether contamination from the Chem-Nuclear landfill had failed to meet the goal of “isolation of wastes from the biosphere inhabited by man and his food chains,” Porter said he was unfamiliar with that phrase. He later admitted that the phrase is part of the DHEC regulation’s definition of the term “disposal.”

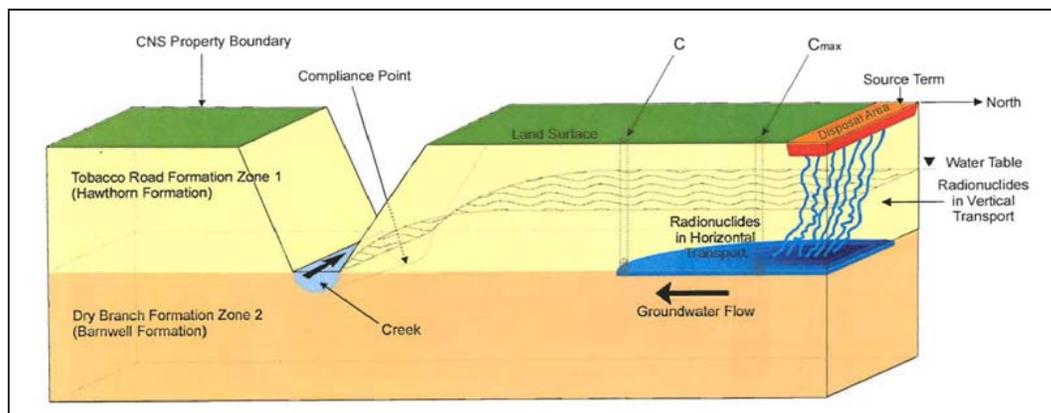
Given that the contamination of groundwater at the landfill boundary currently exceeds state standards, DHEC and Chem-Nuclear have agreed to change the “compliance point” to Mary’s Branch, about 3,000 feet from the site boundary. In the late 1990s, landfill operations involving the pumping of accumulated rainwater from a landfill trench resulted in the contamination of the lands of an adjoining church. Chem-Nuclear excavated and replaced several thousand cu-

bic yards of soil from the church property to reduce the contamination to the level of drinking water standards. Both DHEC and Chem-Nuclear said they were unsure of how the contamination occurred.

Chem-Nuclear presented testimony about a study done by its hydrogeologist that concluded that even if all containment fails, the landfill wastes will not exceed safe radioactivity levels for 2000 years. The actual study was not placed into evidence and was protected as a “trade secret” by Chem-Nuclear. Sierra Club’s expert on radiation testified that significant amounts of waste in this landfill will be dangerous for far more than 2000 years.

DHEC and Chem-Nuclear jointly filed their own proposed order, plus a memorandum of law, urging the judge to affirm the permit as-is to allow the facility to continue to operate under the existing design.

State Administrative Law Judge John Geathers has the matter under advisement and is expected to issue his ruling soon. (Reprinted from Summer/Fall 2005 issue.)



This diagram was used by Chem-Nuclear during the appeal hearing to show how wastes move from the landfill to nearby surface waters.

Mixed Ruling in Radioactive Waste Landfill Case

Chem Nuclear ruling leaves many concerns unanswered.

On October 13, 2005, Administrative Law Judge John Geathers issued his ruling in our appeal of the renewal license for the Chem-Nuclear radioactive waste landfill in Barnwell. The ruling affirmed the decision of the South Carolina Department of Health and Environmental Control (DHEC) staff and upheld the license renewal. The judge’s order, however, found that there are “problems” at the landfill, and he ordered Chem-Nuclear to conduct a study of “the scientific and economic feasibility of employing or implementing designs and operational procedures” to solve those problems.

SCELP represents Sierra Club in this case, which was described in more detail in the Spring/Summer 2005 edition of this newsletter. The appeal ruling followed a four-day hearing held in February 2005.

The problems noted by Judge Geathers are related to the landfill’s failure to properly secure the wastes from

(Continued on page 4)

Mixed Ruling in Radioactive Waste Landfill Case

(Continued from page 3)

water intrusion. His order found: *“The concrete vaults at the Barnwell Facility are not sealed against water intrusion. The floors of the vaults have holes to allow water to drain from the vaults, and the lids of the vaults are not grouted or otherwise sealed to prevent water from entering the vault. Further, when waste is buried underground, a particularly rainy period will moisten the soil around the buried waste, even with enhanced capping. And, the water table rises during wet periods, as documented by monitoring measurements at the Chem-Nuclear site. The Barnwell site receives an average of 47 inches of rain per year; by comparison, desert environments like central Washington where U.S. Ecology has its waste disposal site receive only 10 or 11 inches of rainfall per year.*

“The problems caused by rainfall are compounded because, when Chem-Nuclear is filling a vault, the vault has no cover or roof, so rain can fall directly into the vault during the loading period. . . . Rainfall that accumulates in the trenches eventually percolates into the soil, and drives the groundwater movement that is carrying tritium and other radioactive materials into Mary’s Branch Creek.”

Judge Geathers also found that radioactive materials have been leaking from the landfill for over 25 years.

He noted that DHEC staff had asked Chem-Nuclear to study improved designs and practices for the landfill several years ago, but there has been no follow-up for the past four years. He found that more than ten years ago, Chem-Nuclear had designed a landfill for North Carolina that would solve all of the problems that are present at the company’s South Carolina site.

In assessing the problems at Barnwell, Judge Geathers said, *“The monumental hazardous conditions that can result from tritium and other radioactive materials leaching into the soils, and, in turn, into the groundwater, cannot be ignored.”*

Unfortunately, the order issued by Judge Geathers concluded that the landfill meets all regulatory requirements and affirmed the renewal of the license for the landfill. Although he ordered studies of new designs and procedures, his order fails to say what should or will happen as a result of the studies, nor does it provide any mechanism for review of the adequacy of the study. Our motion for reconsideration was quickly denied.

Sierra Club has appealed Judge Geather’s ruling; the appeal will be heard by the DHEC Board some time in 2006. (Reprinted from Winter/Spring 2005-06 issue.)

Chem-Nuclear Case Moves to the Supreme Court

SCELP’s appeal of the renewal license for the Chem-Nuclear radioactive waste landfill in Barnwell has been delayed by a lawsuit filed by Chem-Nuclear in the South Carolina Supreme Court.

After the November 2005 decision of the Adminis-

trative Law Court (ALC) rejecting Sierra Club’s challenge to the permit, SCELPA appealed the case to the DHEC Board. The ALC had upheld the permit despite finding serious problems with radioactivity leaking from the landfill. We were scheduled to argue our appeal to the DHEC Board in July.

Chem-Nuclear’s lawsuit claims that the 2006 amendments to the SC Administrative Procedures Act eliminates the DHEC Board’s authority to hear our appeal. We believe Chem-Nuclear is wrong. The SC Attorney General agrees with our position and has filed a special brief in the case. The Supreme Court will hear arguments in the case sometime in early 2007.

In the meanwhile, the hearing at the DHEC Board is postponed, waste continues to flow into the landfill, and Chem-Nuclear has done nothing to correct the leaking radioactive materials. The leaking radioactive materials flow into the Savannah River, a source of drinking water for Beaufort County. (Reprinted from Winter/Spring 2006-07 issue.)



Chem-Nuclear: an unlined burial trench at Chem-Nuclear’s radioactive waste landfill.