Statement on Tritium before the House Committee on Intergovernmental Coordination, State of Georgia

Tritium is a highly radioactive isotope of hydrogen, with a specific activity of almost 10,000 curies per gram. In gaseous form, it poses far fewer risks than in other chemical forms. Since tritium has the same chemical properties as hydrogen, it can combine with oxygen to form water. Such tritiated water is radioactive, and has become one of the problem pollutants at many nuclear facilities. In some places it has contaminated groundwater and surface water and continues to do so. One source of such contamination is the Savannah River Site (SRS) in South Carolina, a nuclear weapons site belonging to the US Department of Energy.

Tritium production activities as well as tritium creation as an incidental byproduct of reactor operation at SRS resulted in severe tritium contamination of the shallow aquifers on the plant site. Even though these activities have ceased at SRS, tritium is still present in the groundwater, since it has a half-life of 12.3 years. The long-term threat that the serious shallow aquifer contamination on the SRS site poses to the deeper Tuscaloosa aquifer needs to be carefully and independently evaluated, given the importance of this aquifer to the entire southeastern United States.

SRS tritiated water contamination outcrops into the Savannah River, where it is present in detectable concentrations, but well within current Environmental Protection Agency (EPA) drinking water standards. Tritiated water emissions from SRS operations in the past have also contaminated the groundwater in Georgia. The question of whether tritiated water has crossed under the Savannah River into Georgia groundwater has not yet been resolved due to lack of funds. If that proves to be the case, groundwater in Georgia may continue to be threatened by SRS tritium contamination for decades.

Since tritiated water is processed by plants, animals and humans like ordinary water, the tritium in it can become transformed into other chemicals, such as proteins, needed by the body. It can become part of the DNA. It can affect developing fetuses. Unfortunately, many of these effects, such as miscarriages in early pregnancy that may be induced by exposure of pregnant women to tritiated water, have not been well studied. The combined effects of in-utero exposure to substances such as tritium combined with endocrine disrupting chemicals such as dioxins or PCBs are also not well understood. Regulations for restricting the concentrations of tritium in drinking water are based primarily on cancer risk to adults.

The National Academy of Sciences has been charged with studying the health effects of exposure to radiation. Its committee on the Biological Effects of Ionizing Radiation (the BEIR committee) has issued a number of reports over the decades. However, cancer risk and some aspects of genetic problems have been the main, nearly exclusive focus of this work. Last month, The Institute for Energy and Environmental Research presented a letter to the new BEIR committee (BEIR VII) that has been formed to review radiation risk issues on behalf of more than 70 signatories from 11 countries. This letter asks the committee to look at several specific issues regarding the health effects of radiation. It includes specific items related to the health effects of tritium. I have been assured by the chairman of the BEIR VII committee, Dr. Monson, that the issues raised in the letter will be taken up seriously.

There is currently a great deal of pressure from industry to relax radiation protection standards. Proponents of this view are arguing vociferously and frequently that radiation is far less dangerous than

estimated by the previous BEIR committee that examined low-level radiation, which published its findings in 1990 (called the BEIR V report). Some advocates are even arguing that radiation could be good for you (the “hormesis effect”).

In fact, one of the first presentations that the BEIR VII committee heard was about animal experiments that provide evidence for showing the hormesis effect. The presentation by Dr. Charles Walgren showed animal data to the effect that fewer mutations are produced as a result of high-level radiation exposure if the animals were previously exposed to lower but still very substantial levels of radiation in a single shot (1 to 20 rem). Moreover, the purported protective effect lasts for only a day. Such work has no public health value even if it is correct.

Work on the hormesis effect, which has no public health protection benefits, is being funded and presented to a committee of the National Academy of Sciences, while critical work on the issues associated with tritium remains relatively neglected. This is itself an indication of terribly skewed priorities. It will take considerable and consistent pressure over the next three years during which the BEIR VII committee will meet, to ensure that no unwarranted relaxation of radiation protection standards will result from its failure to deal thoroughly with issues such as the ones we have raised in our letter. I urge you as individuals and the rest of the people of Georgia to sign on to this letter and to express your own additional views to the BEIR VII committee.

Since you are kindly receiving IEER’s guests from France today, I want to note that the work of the BEIR VII committee is likely to have global repercussions. The results of the research of prior BEIR committee’s have been very influential in setting radiation protection standards not only in the United States, but also in many other countries.